

H. 130 1/2 **REPORTS** *Reports*
T. 135 1/2 ON THE
PARIS UNIVERSAL EXHIBITION,
1867.

VOL. II.

CONTAINING REPORTS ON

OIL AND OTHER PAINTINGS.
SCULPTURE.
ARCHITECTURE.
ENGRAVING.
PRINTING AND STATIONERY.
APPLIED ART.
PHOTOGRAPHY.

SCIENTIFIC APPARATUS.
FURNITURE AND DECORATION.
GLASS, POTTERY, AND TERRA
COTTA.
PLATE, JEWELLERY, AND ART
METAL WORK.
LEATHER AND FANCY WORK,
AND PERFUMERY.

Presented to both Houses of Parliament by Command of Her Majesty.



LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY,
FOR HER MAJESTY'S STATIONERY OFFICE.

1868.

[Price 3s. 3d.]

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CONTENTS.

Class	Page
1. Paintings in Oil, by C. W. Cope, Esq., R.A.	1
2. Other Paintings and Drawings, by J. C. Horsley, Esq., R.A.	23
3. Sculpture and Die-sinking, by R. Westmacott, Esq., R.A., F.R.S.	47
4. Architectural Designs and Models, by Professor Donaldson	67
5. Engraving and Lithography, by Julian Marshall, Esq.	85
6. Printing and Books, by Rev. W. H. Brookfield	105
7. Paper, Stationery, Painting and Drawing Materials, and Book-binding, by J. W. Appell, Esq.	135
8. Applications of Drawing and Modelling to the Common Arts, including Designs for Industrial Purposes, by R. Redgrave, Esq., R.A.	137
9. Photographic Proofs and Apparatus, by Dr. Diamond	169
„ Photography, by C. Thurston Thompson, Esq.	185
10. Musical Instruments, by F. Clay, Esq.	197
11. Medical and Surgical Instruments and Apparatus, by Sir J. F. Olliffe, M.D.	221
12. Philosophical Instruments and Apparatus for teaching Science, by C. R. Weld, Esq.	237
13. Maps and Geographical and Cosmographical Apparatus, by Lt.-Col. Cooke, R.E., F.R.G.S.	263
14. Fancy Furniture, by J. H. Pollen, Esq.	279
15. Upholstery and Decorative Work, by Matthew Digby Wyatt, Esq., F.S.A.	319
16. Crystal and Fancy Glass, by Henry Chance, Esq.	373
„ Painting on Glass, by T. Gambier Parry, Esq.	377
17. Pottery, by L. Arnoux, Esq.	391
65. Terra Cotta, by Henry Cole, Esq., C.B.	415
18. Carpets, Tapestry, and other Stuffs for Furniture, by Matthew Digby Wyatt, Esq., F.S.A.	425
19. Paperhangings, by Matthew Digby Wyatt, Esq., F.S.A.	467
21. Gold and Silver Plate, by G. J. Cayley, Esq.	487
22. Bronzes and other Art Castings and Repoussé Work, by G. Wallis, Esq.	499
23. Horological Instruments, by C. R. Weld, Esq.	543
25. Perfumery, by Sydney Whiting, Esq.	563
26. Leather Work, Fancy Articles, and Basket Work, by Sydney Whiting, Esq.	581
36. Jewellery and Precious Stones, by N. H. M. S. Maskelyne, Esq.	593



INTRODUCTION.

THE following Reports on the various Classes in the Paris Exhibition, 1867, were prepared for the Science and Art Department in accordance with the directions of the Lords of the Committee of Council on Education, and must not be confounded with the International Jury Reports to be issued by the French Government, which are quite distinct.

The scope and object of these Reports will be gathered from the following extracts from the letter to the gentlemen who were requested to prepare them, and who in many cases were not connected with the International Jury:—

“The Lord President of the Council, following the precedent of the Paris Exhibition of 1855, is desirous of obtaining a series of Reports on the objects exhibited in the Paris Exhibition of this year. . . .”

“The special object of this Report is to direct the attention of British visitors, manufacturers, and others, to the useful novelties exhibited by various nations on the present occasion, to which it appears desirable their attention should be called. It is not intended to be an exhaustive Report upon the class, which it is presumed will be made by the International Juries for the Imperial Commission. The British Report should have special reference to the objects exhibited by the British Colonies and by Foreign countries, rather than those exhibited by the United Kingdom, although the latter should not be overlooked.”

“It is desirable that the Report should be as short as may be consistent with the nature of the subject, and it is absolutely necessary that it should be published during the Exhibition. It will therefore be indispensable that if the Report be undertaken by you, the manuscript should be delivered before the 15th of June at latest, and as much earlier as may be possible, to Captain Donnelly, R.E., the Secretary to the British Juries, who will afford all necessary information in Paris, and will act as Editor to the Reports.”

"It is probable that the Exhibition will be sufficiently arranged to enable an examination of the Class to be commenced about the 15th April."

With the view of rendering these Reports useful to the public while the Exhibition lasted it was determined to publish them in a newspaper as quickly as possible. Arrangements having been made with the manager of the *Illustrated London News*, who undertook to produce them free of all cost to the Science and Art Department with a certain amount of illustration, the publication commenced on the 6th July 1867, and continued till the 7th December. By that time about two-thirds of the Reports had been published. These have been revised by the authors, and with the unpublished ones are complete in these volumes.

In arranging the Reports the order of the French classification has not been implicitly followed. The amount of matter rendering the division into four volumes desirable, those reports were brought together in each volume which appeared most allied to one another, an arrangement dictated as much by what seemed likely to be to the convenience of purchasers of single volumes as by any idea of a scientific classification.

REPORTS.

REPORT ON PAINTINGS IN OIL.—(Class 1.)—By C. W.
COPE, Esq., R.A.

MR. COPE
ON
PAINTINGS
IN OIL.

IN reviewing the pictures exhibited in the Paris Universal Exhibition of 1867, it will be most convenient to consider them in the order in which they are placed in the catalogue, and the first we find in the series is the collection contributed by France.

General im-
pressions.

On entering these galleries, the visitor is impressed with their vast space, and the great number and size of the works exhibited; and this impression is confirmed when he finds that nearly one half of that part of the building devoted to art is occupied by French productions only.

French
gallery.

The number of oil pictures exhibited by France is no less than 625. France has, in fact, considered this as a great international competitive trial of strength; and we find that galleries, palaces, churches, and museums have poured forth their treasures to swell the amount of works, and to assert the supremacy of France in matters of taste. The works were most carefully selected out of (it is stated) the number of 10,000, by a jury composed of the very ablest painters in France.

It would be, however, a mistake to suppose that the Exhibition generally can be considered in any sense as a *competition*. A competition can only be considered fair when all parties are equally well represented, and have entered the lists with the intention of competing, and with a collection of carefully selected pictures by their ablest professors.

Now it happens that the art of France alone is at all adequately represented. It must be admitted that no other country has such vast stores to fall back upon. This arises from various causes, but principally from the extensive system of competition pursued in art-education, upon which the whole system of French art-culture is founded. The student is subjected to its influence from the very commencement of his career; he gains a place by it in the Academy; he there competes for the Prix de Rome; he afterwards produces works to be exhibited at the annual

MR. COPE
ON
PAINTINGS
IN OIL.

salon, which he hopes will procure him the distinction of first, second or third class medals. He anticipates, more remotely, the distinction of being made a member of the Legion of Honour; secondly, an officer; and, thirdly, a commander. Many of his most successful works are purchased by the State, and are deposited in galleries or museums in Paris or in the provinces. In addition to this, the more distinguished artists are constantly commissioned to chronicle on canvas the great passing events of their history, especially the victories of the French army; and these, which form a most extensive and important collection, are not only ready at all times for any national display, but even exercise a vast influence upon the minds of the French people, who are thus stimulated to a passion for military glory, and perhaps led to an overweening estimate of its importance.

As so large a proportion of the space available for pictures had been appropriated by France, it early became evident that there was not adequate room for even the comparatively small number of contributions sent by other nations. Accordingly, the Governments of Belgium, Holland, Switzerland, and Bavaria declined to accept the limited accommodation offered them, and constructed their own separate galleries in the park, outside the main building, in which to exhibit the performances of their painters.

Another general characteristic which impresses the visitor in the French collection is that the majority of important pictures represent either nude female forms or battles, and that the enthusiastic devotion to the classic element, which distinguished the late school of David, and which had, to some extent, the effect of preserving a pure moral sentiment, is rapidly disappearing; and that the ascendancy gained by the "romantic" over the classical school in the Beaux Arts is everywhere becoming more apparent.

The strict attention to design inculcated in the school of David, and enforced so strongly by Ingres, and without which there is no hope to the students in art to attain the Prix de Rome, seems to have no longer a worthy theme on which to display itself.

By the terms of their agreement, the students at Rome are bound to send specimens of their progress to be submitted to the directors of the Academy in Paris, and these specimens must possess the utmost accuracy in designing the naked human form; but as the taste for exclusively classical themes no longer exists, they are led to comply with the rules by representation of figures more congenial to modern French notions. Thus, we no longer find

studies of Achilles or Romulus, or other ancient heroes, but their places are occupied by paintings of Venus, nymphs and goats, Andromedas, and so forth.

MR. COPE
ON
PAINTINGS
IN OIL.

On examination, therefore, it will be found that a great proportion of the conspicuous nudities are executed by the pensioner students of the French Academy at Rome, and are generally interesting only as specimens of strict academic training; and it may be hoped that their authors will be led subsequently to devote themselves to other branches of art more intellectual and pure in character.

On comparing the present school of France with that which existed a few years ago, it is evident that a great transition is taking place. We find very few representatives of the severe classic style; and even of those subjects taken from Roman history, the greater number relate to her state of luxury or degradation, and frequently to their manners and customs only.

Neither do we find religious or Christian art largely represented. With the death of Ingres and Hippolyte Flandrin, two of the greatest upholders of the pure classic taste have disappeared.

Of the lamented Flandrin (Jean Hippolyte) we have only a portrait of the Emperor, executed in the careful manner his academic training had engendered, and carried out with the utmost precision of design. Work more congenial to his taste will be found in some beautiful studies for his frescoes executed for the Church of St. Germain des Près, exhibited in an adjoining room.

On examining the works of the present representatives of classic art, it will be found that Cabanel alone is very ambitious in his aspirations. He exhibits six works, three of which are epic, and three are portraits. His large work of "Paradise Lost" affords a very instructive lesson, showing the inadequacy of mere art-language to convey interest unless it has a deeper motive than academic display. The attempt to paint the Deity (an effort always to be deprecated), surrounded by his angelic ministers, is a direct imitation of Raphael. The influence of Michael Angelo is conspicuous in the figure of Adam: the figures of Eve and Satan are in his own manner. The colouring is influenced by Titian, but it is not Titianesque, being white and feeble; and, as must invariably happen in all imitations, in no one quality is the art carried so far as it was carried by those he has imitated. In No. 120, "Nymph and Fawn," great academic skill is displayed in a very offensive subject. "The birth of Venus" (22) is a picture

Classic
French art.

MR. COPE
ON
PAINTINGS
IN OIL.

of a more delicately moulded female form, but the colour is cold and weak to feebleness. Extreme delicacy of tone is quite compatible with warmth and vigour. The portraits of M. Cabanel are well designed: that of M. Rouher, "the Minister of State," is the most interesting of his pictures.

If we go on with the inquiry as to other representatives of the classic school, we meet with a difficulty in finding any; but we may group together the names of Ulmann, Bouguereau, Sellier, and Hamon, the first three of whom have gained the Prix de Rome, and the last resides there.

Of these Hamon is the largest and most interesting contributor; he sends eight works. They are treated in a certain shadowy, grey manner; and there is much feeling for beauty of form in the dreamy mistiness of the picture of the "Muses leaving the Ruins of Pompeii." His "Aurora" is a colourless, antique figure, sipping dew from the flower of a convolvulus. His work has more relation to sculpture than to painting. Bouguereau sends mostly academic nudités, in addition to a well-designed whole-length; Ulmann, a picture of Junius Brutus; and Sellier, in addition to a picture of "The Levite of Ephraim Cursing the Town Gibeah," and a dead Hero and Leander, possessing great elegance of form, sends a really clever study from nature of a most disgusting subject, the "Ammazzatoio" at Rome.

Romantic
school of
France.

Meissonier
and Gérôme.

But if we turn in another direction, and inquire into the condition of the modern "romantic" and "genre" school, we get a very different result: for we find a long list of names of very excellent artists. Conspicuous amongst them are Meissonier and Gérôme. The former contributes fourteen, and the latter thirteen works; and, although their pictures are of cabinet proportions, they may be considered the principal upholders of French art in the present Exhibition.

As excellent examples of the talent of Meissonier, may be mentioned the following pictures, although all of them are more or less stamped with his peculiar microscopic genius:—"The Emperor at Solferino," one of his most complete and important works; the extent of space, the minute accuracy and finished drawing, the variety of character in the figures of men and animals, the quiet grey sky, and the spirited execution, are all admirable. Equally good is "Napoleon I. in Russia;" the severe, leaden, cold sky; the advancing Emperor and his staff, muffled and stern; the tramping mass of troops in the middle-distance; and the broken, hard, cloddy ground, half covered with snow, are excellent.

The same qualities are equally apparent in the natural look and truth of effect in the picture of "General Desaix" listening to a peasant who is giving intelligence. The simple action and character of the countryman are as characteristic as the group of Generals round the fire in the wintry wood.

In his pictures of figures somewhat larger in scale Meissonier is less excellent, and we miss that peculiarly focussed look, which is one of his great excellencies; as, for instance, in his portrait of M. G. Delahante, and in a lesser degree in his "Lecture" and "L'Ordonnance."

Gérôme is a painter of a very different stamp. Taking a wider range of subject, accurate in form, a vein of sarcasm and almost cruelty pervades all his works. Man is represented as a sensualist, woman as his victim. His great talent is undeniable. His picture of "The Duel" is an example of his peculiarities, and less hard in style than are his later productions. The group of surgeon and friends, all arrayed in their fancy-ball dresses, round the dying victim; his heavy weight and helplessness; the retiring victor, dressed in the costume of a Cherokee Indian with a harlequin friend for his second; the misty wintry morning, the trampled snow, and the hearselike carriages waiting in the dismal back-ground, are all most thoroughly thought out, and well rendered. The picture of "Louis XIV. and Molière" is an example of his treatment of subjects of another character. The quiet figure of Molière, amused, yet composed and self-possessed, is admirably conceived, and is in strong contrast to the excited and perhaps overdone anger of the courtiers.

The most agreeable of his works are, "Egyptian Corn-thrashing" and "The Prisoner;" but all of them are conspicuous for strength of intellectual conception and dramatic force, while some are painful both in subject and treatment. Gérôme is an example of the advantages, as well as the disadvantages, of severe academic training; the former in the accuracy of his drawing, the latter in his hard severity of outline.

We next come to a long list of figure-painters of various kinds of excellence, who may be said to exemplify the present condition and tendency of French art. None of them are academic, and many of them are so various in their choice of subjects that it is almost impossible to classify them. They may, however, possibly be divided into four classes—namely, Historical-Romantic, Costume Subjects, and Portraits, Rustic and Boudoir.

MR. COPE
ON
PAINTINGS
IN OIL.

R. Fleury.

Tissier.

Brion.

Comte.

Portraits
and
"Genre."

Jalabert.

Bonnat.

Hébert.

Landelle.

Henriette
Browne.

Roux, &c.

Breton and
Millet.

Among the most conspicuous in the first class of historical-romantic may be mentioned the names of R. Fleury (the present director of the Academy des Beaux Arts and member of the Institute), who is represented by one picture only, "Charles V. at the Monastery of St. Just." Tissier is the painter of the modern historical picture of "The Prince President restoring Liberty to Abd-el-Kader," and two portraits. Brion has three pictures, all different in aim and treatment—"A Town besieged by Romans," showing great knowledge of Roman antiquities; "Jesus" and "St. Peter on the Sea;" and a rustic wood scene of the "Pilgrims of St. Adile." Comte also contributes three works, the best of which is the small picture of "Éléonore d'Este and Henri de Guise."

The principal representatives of costume subjects and portraits are more numerous, and their pictures are both important and interesting, and the following may be named as among the best painters of France:—Jalabert a very excellent artist, his portrait, No. 374, is a charming study from nature, delicately painted, and tender in treatment; his group, No. 371, "Widow and Children," and No. 373, "Maria Abruzeze," a study of a pretty Italian mountaineer, are far more excellent than a more ambitious effort of "Christ Walking on the Sea;" Bonnat, a most excellent colourist of small Italian costume pictures, less good in his larger work of "St. Vincent de Paul;" Hébert, the painter of two very good pictures of Neapolitan fountain subjects and some portraits; Landelle, who seems to try everything, from an academic nudity to imitations of Gérôme, but whose best picture is his smallest, "Mass at Béost;" M^{de}me. Henriette Browne, the painter of the well-known "Sœurs de Charité" and seven other works, all excellent for their feeling, light and shadow, and tender treatment of colour. Gide, subjects of monks in churches; Roux, who sends two works, the best an imitation of Rembrandt; Caraud and Baron are also contributors. There is an interesting head by Winterhalter, "The Empress;" and Dubufe, besides some good portraits, sends a picture in three compartments, remarkable for size, of "The Prodigal Son."

Of painters of French rustic life, we find some excellent examples; Breton and Millet are among the foremost. Millet sends nine works, all characterised by poetical feeling and a perception of subdued, deep-toned colour: his large subject of a woman shearing sheep indicates a degree of training in the figure which is not usual among

our rustic figure painters. No. 477, "Clair de Lune," and No. 480, "L'Angelus du Soir," are charming pictures.

MR. COPE
ON
PAINTINGS
IN OIL.

Breton sends eight specimens: his feeling in art is somewhat analogous to that of Millet, but, unlike him, his figures are more important than the landscape backgrounds. His "Benediction des Blés" and "Plantation d'un Calvaire" are extensive compositions of many figures. A more interesting specimen is the "Rappel des Glaneuses," a very charming work both in feeling and effect. P. E. Frère sends eight excellent specimens; Duverger a good little picture called "Cache-cache," and (No. 241) "The Labourer and his Children." Guillemin contributes three pictures, his "La Bretagne en 1793" is a good interior.

Frère.
Duverger.
Guillemin.

As a general remark, it may be asserted that the best art (to be found at present in France) is among the "romantic" and "genre" painters.

There are also to be noticed a group of good painters of familiar figure-subjects on a small scale, among whom are Toulmouche, Plassan, Fichel, and Vetter. Toulmouche unites very finished execution with good expression. Plassan has four small boudoir pictures. Fichel sends three highly-finished little pictures; and there are five by Vetter, among which is one of the subject also painted by Gérôme, of "Molière and Louis XIV."

Figure-
subjects.

The landscape art in France has of late years made considerable progress, also in the direction of the picturesque. It is characterised by largeness and breadth of treatment, aiming mostly at bold, strong effects of nature, executed in a coarse and vigorous impasto, rather than by any feeling or delicacy. There is no painter at all equal either to our own Turner or Constable, and much of their art seems founded upon the style of the latter painter.

Landscape
art.

Daubigny, T. H. Rousseau, Dupré, Français, Corot, Lanove, Belly, Ziem, Cabat, and Lambinet are the principal representatives of this branch of art. Theodore Rousseau is an important contributor. Of his eight pictures, perhaps No. 547, "Evening after Rain," and No. 549, "A Farm on the Banks of the Oise," are the best examples among his smaller works, while No. 544, "Oak and Rocks at Fontainebleau," illustrates his larger style. Daubigny also sends eight very excellent works, his "Evening, with Figures and Sheep advancing," No. 186, is a very charming picture, both in composition, tone, and colour. Lanove contributes some excellent views on the Tiber, very true to nature; and Dupré (Jules) is a good painter of strong effects, executed in a vigorous impasto; his "Cattle passing

Rousseau.

Daubigny.

Lanove.

Dupré
(Jules).

MR. COPE : a Rustic Bridge," No. 227, is an excellent example. Belly
ON
PAINTINGS has six pictures of Eastern scenery, of which No. 27 is
IN OIL. especially good. "Pilgrims on their Journey to Mecca," an
Belly. Egyptian plain, the sun descending behind trees, pyramids
in the distance, sheep and figures advancing over the dusty
and hot road. Cabat sends two Pouissin-like compositions,
Cabat and and Ziem three pictures of fierce Venetian effects.
Ziem.

Battles. A striking feature in the French portion of the Exhibi-
tion is the great preponderance of battle-pieces. The most
important are contributed by the Government, and they
are the result of commissions given to various artists to
commemorate the battles in which the arms of France have
been victorious.

Yvon. Thus, we have two enormous pictures, by Yvon, of the
contest in the Crimea, one the "Capture of the Mala-
koff," the other the struggle in "Gorge de Malakoff,"
works characterised by prodigious vigour and panoramic
power. Another of these gigantic battle-pieces is "The
Pils. Battle of the Alma," by Pils; who also sends a large un-
finished work of a "Fête in Algiers given to the Emperor
and Empress."

The prospect which such national employment affords
must have the effect of giving a powerful impulse to artists
to produce works in this direction, and this partly accounts
for the number of battle-pieces we find in all French ex-
hibitions. There are no less than twenty-one in the present
collection.

Bellangé. The late Bellangé is represented by seven subjects of
this class, tempered by some expressions of human kind-
ness, as for instance, No. 20, "The Two Friends, Sebastopol,
1853;" No. 25, "La Garde meurt, June 18, 1815," is a
very clever, spirited sketch of the famous episode at Waterloo.

Protais. Protais contributes three interesting subjects of this
class; No. 523, "The Morning before the Attack," and
No. 524, "The Evening after the Combat." They are
better in feeling and effect than in painting. "The
Morning" is fresh and clear in colour; the troops wait in
hushed and excited silence for the word of command for
the forward rush. In "The Evening" they have regathered,
hot, tired, dusty, and wounded, friends embrace each other,
the "rappel" is sounding, they occupy ground cumbered
with fallen foes. The third picture (No. 525), "Return to
Camp," is of the same character, but of a deeper and more
solemn tone of colour.

Animal painting. In animal painting we find some very clever works by
Fromentin, Rosa Bonheur, and the late Troyon.

Fromentin contributes seven pictures of Arab life. The horses are full of spirit, and there is a great vigour in his general treatment and execution. Of Rosa Bonheur we find no less than ten pictures, all in her usual manner. No. 50, "Sheep on the Seaside," belonging to the Empress, is painted in a very delicate key, and is more refined throughout than some of her other works. The cool blue-green of the sea, coming in opposition to the warm colour of the sheep, is particularly happy in effect. There are also five contributions by the late clever painter Troyon.

MR. COPE
ON
PAINTINGS
IN OIL.

Fromentin.

Rosa
Bonheur.

Troyon.

Out of the number of 625 pictures exhibited by France, no less than 252 are contributed either by the State or by public museums of art scattered through the principal towns, showing what a vast amount of encouragement the French artists receive as well as what an interest *is taken by the nation* in matters of taste.

BELGIAN ART.

It has been already mentioned that, in consequence of the dissatisfaction expressed by the Belgian artists with the limited space allotted to them in the International Exhibition, their Government undertook, at its own cost, to erect a separate and suitable gallery outside the main building. This has accordingly been done, and we find collected in it carefully selected specimens of the works of some of their principal painters. The Belgian artists, like their Flemish ancestors, delight most in scenes of home life, although their art-language is more French than Flemish in its character and treatment, possessing little of the juicy touch and transparent colour of the old school. The principal representatives are few in number, and out of 186 pictures, 52 are sent by five artists only, namely, Leys, Stevens, Willems, Verlat, and the marine-painter, Clays.

Belgian art.

Leys is the principal contributor. He sends 12 works, some of them of considerable size, and all in the same peculiar mediæval style this able painter has chosen to adopt. They are all subjects taken from the stirring period of the great struggle with Spain for religious and civil freedom in the sixteenth century, and are interesting specimens of the master.

Leys.

Stevens sends no less than 18 works, all of them of small size and of domestic interest. He has a fine feeling for colour and texture. Many of his pictures are merely studies of single figures, such as No. 122, "La Dame Rose," a lady in pink muslin; or No. 129, "Fleurs

Stevens.

MR. COPE
ON
PAINTINGS
IN OIL.

d'Automne," a lady in grey examining an autumn nosegay; but he is capable of touching a deeper chord, as in No. 132, "Consolation," a picture admirable for its expression of kind and simple feeling of sympathy with suffering; as a contrast to which may be mentioned No. 123, "Tous les Bonheurs," representing the deep and quiet happiness of a young mother nursing her hungry but well satisfied infant.

Willems.

Willems contributes 13 of his popular pictures, all scenes of home life in the seventeenth century. His subjects are very slight incidents of daily occurrence, but in his narrow range he contrives to produce excellent work. His pictures possess great breadth of light and shadow, and agreeable negative colour. His principal composition is "L'accouchée," representing the interior of an apartment in which lies asleep, on a beautiful bed, a young mother; the quiet rest after previous exhaustion is charmingly expressed, the healthy country nurse is attending to the hungry infant's wants, while two visitors approaching on tiptoe are hushed by the warning action of the lady (mother) in black.

Another excellent specimen of this painter's work is a small picture called "J'y étais," a quiet old soldier, with his back turned, looking at the picture of a sea-fight, while his companion, a young lady in yellow satin, is listening to his remarks. The colour and arrangement of this little picture are admirable.

Other
Belgian
painters.

Verlat is a painter of a more ambitious aim than the preceding; he exhibits four works. A "Dead Christ at the Foot of the Cross"—well drawn and meritorious in workmanship; a large rustic picture, called "Au Loup!"—some peasants rescuing a dead lamb; an excellent small portrait of the late painter "J. Lies;" and "La Vierge et l'Enfant Jésus"—a very carefully elaborated picture of very high aim and tender feeling.

Pauwels (Ferd.) is a very interesting painter of history on a small scale; of his four pictures, that of, "The Return of those proscribed by the Duke of Alba" may be mentioned as full of tender feeling and breadth of effect. The centre group of the wife embracing her husband has unobtrusive and quiet dignity, and the figures are well composed, while the expression is not overdone. The waving flags, the acclamations of the people, and the ringing of bells are all sufficiently hinted at. Hamman sends three pictures. No. 62, "The Education of Charles V.," is the most interesting; the weary expression of the young prince, seated,

with dangling legs, in a high chair, listening to the lecture by Erasmus, is very good. We have also De Groux, a painter of scenes of humble life, having great merit of expression; and De Winne, a good portrait painter.

MR. COPE
ON
PAINTINGS
IN OIL.

The principal landscape-painter is Clays, an able artist; his five pictures of Dutch boats, seacoast, and sky are all excellent in colour, and in their truth to nature.

The visitor will leave this gallery with a feeling that the art of Belgium (as here represented), if not very high in aim or wide in range, is in a sound and healthy condition. There are few contributors, but those present are well represented, and it is a subject of regret that there are no works by Gallait.

HOLLAND.

The separate gallery constructed by the Government of Holland is placed near that of Belgium. The number of pictures is 170. Most of them have a greater affinity with the broad generality of treatment and solid painting of the French school than with the refined delicacy of execution and rich juciness of colour so characteristic of the old Dutchmen. The figure-subjects of their pictures are generally taken from familiar life. The most impressive and powerful of their painters is Israëls; (80), "The Last Sigh," is an instance of this power. The effect of the picture is very solemn and true in tone, and excellent in feeling, but coarse in execution and negligent in form. No. 84 is equally good in tone and effect, and admirable in the treatment of the whites; and in No. (78), "Le vrai Soutien," the expression of the weak mother as she regards her staggering child is full of tenderness. All his five works are equally characteristic.

Israëls.

Bles sends, amongst others, a touching subject of "La Place Vide au Foyer;" and Alma Tadema contributes thirteen pictures of Egyptian or Roman archæological interest.

Other Dutch
painters.

Bakkerkorff has three diminutive productions, after the manner of Meissonier; No. 19, an old woman "Reading a Newspaper," is very good in character.

Schendel sends several pictures, all subjects of candle-light effect, remarkable rather for their smooth surface than for any high artistic quality. Such candle-light treatment is not objectionable in the representation of fairs and market-places; but it is not applicable to some subjects of a higher character, such as we here find that he has attempted.

MR. COPE
ON
PAINTINGS
IN OIL.

There are two interesting little works by Scheltema, and one by Trigt of a "Catechism in a Lutheran Church."

Among the landscapes may be mentioned a charming little picture, No. 120, "The Swallows," by Roelofs; and some Dutch scenes, not badly executed, by Verveer.

PRUSSIA.

Prussia.

Returning to the main building, and entering the galleries devoted to the art of Prussia and the northern States of Germany, we find that the great majority of the pictures consists of genre subjects and landscape; there are few attempts at historical painting, and still fewer at religious art.

Knaus, &c.

The principal contributor in the school of Prussia is Knaus, a painter of familiar subjects of common life, showing much appreciation of rustic character and humour. Of his seven pictures No. 61 may be mentioned as an admirable study of character; No. 57, "The Mousetrap," is a study of Rembrandt-like effect; while No. 60, "Saltimbanque," represents a crowd of rustics in a barn astonished at the performances of a juggler.

Menzel contributes a large dark picture of "Frederick the Great at Hochkirch," placed too high; and among other principal contributors may be mentioned the names of Haberle, Becker, Scholtz, Lasch, Heilbuth, and Kruger, in figure subjects. Hunten sends two battle-pieces, of actions with the poor Danes; and the principal landscape art is contributed by Saal, Hoeter, and Gude.

The productions of Prussia mostly emanate from the school of Dusseldorf. They possess no very special character to distinguish them from French art, to which they are gradually more and more tending. The peculiarly national art of Germany is rather to be looked for in her frescoes, or large wall pictures, than in her oil paintings. The number of works contributed is 98, the majority of which are the property of the painters.

BAVARIA.

Bavaria.

The next school of art in the order of the catalogue is Bavaria; but to examine her productions the visitor must again leave the main building and enter the separate series of galleries constructed in the park outside, near the Ecole Militaire.

The Bavarian school of oil painting is more excellent in design than in effect or colour. For them the great Venetians might never have existed. Educated in a school

of monumental art, suited to the decoration of large public buildings, they seem unable to shake off its severe fetters. We must not, therefore, expect to find great skill in the graces of execution and colour; but they will be found to possess great ability in composition, and considerable dramatic power. This modern school, like that of most continental schools, seems founded upon that of France, both in its style of work, its perception of nature, and in the subjects it most affects.

The principal contributors are Piloty, Horschelt, Adam, Schuets, Schwind, and Liezenmayer in figure subjects.

An able picture, by Piloty, is "The Murder of Cæsar," a dramatic scene, vigorously executed. His "Peter Domenicus preaching to the Soldiers," painted in 1856, is a better picture, well composed, and solemn in effect; he sends four works. Adam and Horschelt are represented by battle pictures. The latter, "The Storming of an Intrenchment of Schamyl by the Russians," is a vigorous composition. Adam (Francis) sends an impressive picture, "The Road between Solferino and Valeggio," (3) a scene observed by the artist on the spot, and rendered with great fidelity. The variety in the grouping, the various kinds and degrees of suffering, the heat and dust, are very true to nature, and give the picture a terrible kind of interest. Schuets sends a pretty but hard picture of "Easter Morning;" Schwind some weird-like subjects; and Liezenmayer's No. 105, "Canonisation of Elizabeth of Hungary," is an impressive picture.

Piloty.
Other
Bavarian
painters.

Voltz sends some very clever cattle pieces; and among the landscape paintings are some effective little pictures by Adolphus Lier—especially good are his Nos. 102 and 103; and there are some good portraits by Lenback. It should not be omitted that there are also in this gallery a series of large monumental works, destined for the Maximilianeum at Munich.

The number of oil pictures contributed by Bavaria is 211. Out of this number 119 are sent by the artists themselves, and are mostly for sale.

AUSTRIA.

Austria is represented in a gallery of the main building. There are eighty-nine contributions. Among the most important works are No. 49, "The Diet of Warsaw, 1773," by Matejiko—a large scenic picture, coarsely executed, with strong impasto, and not ill composed; No. 18, by Engerth, an immense picture of a "Victory over the Turks by Prince

Austria.

MR. COPE
ON
PAINTINGS
IN OIL.

Eugene ;" No. 5, "The Battle of Colin," by Allemand (Sigismund); and an equestrian portrait, by Thoren, of "The Emperor of Austria." In "genre" painting there are contributions by Waldmüller, Schön, Löffler, and Friedlander; and a marine picture, in which a steam-ram is probably for the first time introduced, is contributed by Puttner.

The Art of Austria is in no way remarkable for any distinctive national traits. The painting is coarse and opaque, and the subjects chosen are usually highly dramatic, depending more on the interest of the story to be told than on any refined qualities of treatment.

SWITZERLAND.

Switzer-
land.

Switzerland has also constructed a gallery of her own in the park, in which to exhibit her art-productions. If not conspicuous for very great excellence in her paintings, she boasts of possessing some first-rate engravers, especially in Weber and Girardet. She contributes 112 pictures, the larger number of which are views of scenes of great natural grandeur among her mountain retirements, and as such are interesting and often impressive. But her landscape painters have not yet learned that the simplest subject in nature becomes interesting when treated by an able artist, while the greatest scenes are comparatively unimpressive unless they are influenced by poetical feeling and artistic treatment.

SPAIN.

Spain.

Returning to the principal galleries in the main building, we enter that devoted to Spanish art. The works, forty-two in number, are characterised by a deep tone of colour, and strong vigorous impasto. Among the principal contributors may be named Rosales, who sends No. 36, "Isabella the Catholic making her Will," an agreeable, solemn picture in effect and colour, the faces and hands not sufficiently attended to; Gisbert, the painter of No. 14, "Landing of the Pilgrim Fathers," and two good small portraits in ancient costumes, one a flute and the other a guitar player, Nos. 16 and 17. Palmaroli, who has an effective piece of strong colour, in No. 31, "Sermon in the Sistine Chapel; Gonzalvo, a large "interior," which has the same qualities; and Maureta, who sends an agreeably-coloured picture (26), "Tasso in the Convent of St. Onofrio." There are also a vigorous Tiepolo-like study by Agrasot, and two small pictures somewhat in the style of Meissonier, by Ruiperez.

Casado del Alisal and Sans also contribute each a large picture. We find little in the way of landscape art; Rico has attempted one rocky scene, and Gesa sends some well-painted still life. The influence of France on the art of Spain is evident.

MR. COPE
ON
PAINTINGS
IN OIL.

PORTUGAL.

The specimens sent by Portugal are few and unimportant, being only twenty-three in number. Lupi is the most conspicuous contributor, he sends a picture of "Tintoret and his Daughter," and three portraits, executed in a peculiar style on a granulated surface.

Portugal.

GREECE.

Greece contributes four pictures, the principal one being a moonlight picture, by Litras, of "Antigone," in the style of the French school.

Greece.

DENMARK, SWEDEN, AND NORWAY.

Next in order are the schools of Denmark, Sweden, and Norway.

Denmark,
Sweden, and
Norway.

Denmark is represented by twenty-nine oil-pictures. The only effort of an historical character is the contribution, by Block, of "Samson" (2), a powerful man turning a corn-mill, and goaded by a leering old man seated in the centre. The remaining pictures of this school consist entirely of genre and landscape art. Mdme. Jerichau sends eight works, the most interesting of which are the "Shipwreck on the Coast of Jutland" and a small picture called "La Raccomodeuse." There is a very good landscape, by Rump, of some well-drawn trees and a quiet lake in the distance; and two vigorous marine pictures by Sverensen. In No. 29 the force of the rolling sea is excellently rendered.

In noticing the works of Sweden and Norway, it would be a neglect not to mention the vigorous scenic pictures by his Majesty Charles XV. The school, generally, is in close relationship with that of Dusseldorf, at which place most of the principal painters reside, so that it may be almost considered as a branch of that school. The principal if not the only picture of history is No. 18, by Hoeckert, an interesting night scene, dark almost to obscurity, and placed too high. Hoeckert's other two pictures can be better seen. His "Lapland Interior" (19) is an interesting and excellent work; and his small picture, "Return from the Wedding" (20), is a pleasant representation of a

MR. COPE
ON
PAINTINGS
IN OIL.

bride, crowned with a large golden ornament, landing out of a boat. The colour is fresh, and breathes with the cool air of morning. Tidemand contributes the well-known picture of the "Combat in Ancient days," a large Norwegian composition, where both the combatants are slain; and No. 44, a "Lutheran Sacrament administered to the "Old and Infirm." Fagerlin is a very excellent painter of genre subjects. His three pictures are admirable, both in character and expression. In No. 16, "Jealousy," the figure of the (very justly) jealous girl is most successful. Malmström's "Elves by Moonlight" is poetical; and Hansen's good little work, "Visit to a Châlet," Boklund's, No. 9, "Un Savant," and Wallander's small humorous pictures are all worthy of remark. In landscape art, the principal painters of Sweden are Berg and Staaff; and of Norway Eckersberg, Gude, Nielsen, and Müller. A rocky hillside in Sweden (24), painted by Kioerboe, represents the Prince of Wales elk-shooting, the hillsides being much better in execution than the figures. The colour of these schools partakes of the black and dreary character and solid opacity of that of Dusseldorf. Sweden contributes fifty-four works; Norway is represented by forty-five.

RUSSIA.

Russia.

On entering the rooms devoted to Russian art, which is mostly genre in its tendencies, the visitor looks in vain for anything nationally characteristic. There is no lack of Muscovite or Finland subjects, but they are treated in the modern French manner, and seem rather French than Russian. There is but one attempt at painting an elevated subject (19), by Gué, "The Last Supper," an impressive picture. The foreboding expression of the reclining figure of Christ is well rendered; while the light on the ground concealed by the dark figure of the traitor Judas is effective, although somewhat theatrical. Simmler also contributes two pictures of history.

The principal genre contributors are Péroff, Bizzoni, and Popoff. Of Péroff's five highly-finished little pictures his best is "A Village Funeral" (34)—pure in colour and tender in feeling, representing a sledge containing a dead child, and the open coffin driven over the snow by the sorrowing mother. Popoff sends a national village scene; and Rizzoni's four small pictures are subjects of Jewish synagogues painted in Rome.

The painters of battle scenes are Kotzebue, who sends two works (24) "Battle of Pultawa"—very vigorous—and

Bogolionboff, whose marine combats are almost the only *national* pictures to be seen in the gallery.

MR. COPE
ON
PAINTINGS
IN OIL.

Among the landscapes are an excellent picture by Clodt, No. 9, a flat country in rainy weather; and a moonlight at sea, by Ayvasovsky. The number of pictures is sixty-three.

ITALY.

The next gallery is that devoted to Italy. The modern Italy. art of Italy, like that of most of the Continental schools, seems to be an offshoot from that of France, and has no distinctive character of its own. The inspiring religious motive of its earlier schools no longer exists, and art seems as objectless in aim as it is weak in expression.

Among the few able painters of the school (some of whom reside in Paris), all are more or less imbued with the modern French feeling in art. Among these may be mentioned Farruffini, who contributes No. 14, "Machiavel and Borgia," and a very clever sketch for a large picture of a bread-giving scene in a cathedral (not named in the catalogue); Ussi, who is represented by a well-executed picture (also not named); Gastaldi, who sends a large, well-executed battle-piece, No. 4, of "The Siege of Tortosa by Barbarossa;" Zoud, who sends a "Meeting between Titian and Paul Veronese" (not at all Venetian); and Focosi, who sends a picture of strong effect, No. 15, "Catherine de Medicis and Charles IX."

Of "romantic" and "genre" pictures, there are two works by Hayez, one by Yoma (not in the catalogue), of a man under torture by Inquisitors; and three by Morelli. The only one found in the catalogue, "Bagno Pompeiano," is eminently French in taste.

The principal contributor of landscapes is Palizzi, who sends three pictures of considerable merit, in the French manner. The number of contributions is fifty-one.

PAPAL STATES.

Of the 25 pictures belonging to the Papal States, that by Papal States. Busi (Bologna), No. 37, "Tasso's Retirement to a Convent," is an interesting picture.

TURKEY.

Turkey contributes seven pictures, among which are Turkey. some attempts at still life, in the French manner.

MR. COPE
ON
PAINTINGS
IN OIL.

China.

CHINA.

China is conspicuous only for an entire absence in her few contributions of any of the peculiar merits to be found in most Chinese miniatures.

AMERICA.

United
States.

Next in order is that portion of the English Gallery assigned to America. The number of works contributed by the United States is 75. The larger portion of the pictures consists of landscape views of American scenery. The figure subjects are few, nor are they stamped with any distinctive character. Amongst these may be named a picture by Leutze, of "Mary Stuart hearing Mass at Holyrood," which is strongly tinged with French influence; and a picture of negro life by Johnson (40), suggestive of very little sense of negro enjoyment. Among the figure subjects are also some pictures by May, the most important of which are No. 56, a large subject from "Lear;" and No. 37, by Huntington, "The Republican Court of the Time of Washington," a feebly executed picture of many figures, in the costume of the period.

The landscape art of America has somewhat higher claims on our attention. Among the most important contributors are Church, Boughton, Hart, Kensett, and Bierstadt.

The picture by Church, "Niagara," (8) is interesting both as a picture and as a rendering of a grand subject in nature; Bierstadt represents an Indian encampment among the Rocky Mountains (4); Boughton sends a good little picture of "Winter Twilight;" Hart, a "View on the River Tuneis, Connecticut;" Kensett and other painters send efforts representing the vivid and peculiar colour of the American autumn season. There are also some interesting portraits, namely, the late Abraham Lincoln, by Hunt; and a picture of strong character (by Healy), representing General Sherman.

ENGLAND.

England.

After having gone the whole round of galleries, in or outside the building, we enter the portion occupied by English pictures. Here some observations at once suggest themselves.

First. That the gallery is altogether insufficient in space; that it is placed in the sharpest curve of the oblong form of the building, corresponding with the opposite curve occupied by French sculpture, and which there serves as a sort of

vestibule to their more spacious and symmetrical picture galleries, which are placed on the side of the oblong.

MR. COPE
ON
PAINTINGS
IN OIL.

Secondly. That, in consequence of this limited accommodation, the necessity has arisen of filling the floor space with square screens on which to hang the water-colour drawings. These are therefore mixed together with oil pictures in the same room; to the great disadvantage of both arts.

Thirdly. That many of the leading painters of England have not contributed at all. There are but 123 exhibitors, of whom 26 alone are represented by more than a single specimen.

English art
feebly re-
presented
and ill-
arranged.

The consequences are obvious. While the visitor is enabled to become thoroughly conversant with the style and feeling of each important French or Belgian master, each of whom is largely represented, and his works agreeably grouped together, he is comparatively unimpressed by the single work (however excellent) usually contributed by the English artists.

Notwithstanding these disadvantages, however, there is at once apparent a marked contrast with the whole of the continental schools (Belgium in some cases excepted). England has more individuality and a much greater delicacy and transparency of colour. The picture of "La Gloria" by the late lamented John Philip, is an example of these qualities: a work which, for power and knowledge of art, has not its equal in the whole Exhibition.

Philip.

Neither is English art an offshoot from the art of France. So great is the affinity with modern French art on the Continent, and so near the resemblance in the various schools, that all European art may be said to be in a degree French, and especially so is the best part of it. England alone stands independent; and thus it may be affirmed that there are but two *original* schools in Europe, French and English, and their difference in aim is at once apparent in the present Exhibition.

It has already been mentioned that this Exhibition cannot be considered as *competitive*; but it may not be unadvisable to consider shortly the relative merits and present tendencies of the two leading schools of France (including Belgium) and England. The present art movement in France is in the direction of the picturesque. She has almost entirely given up the classical galvanism of the school of David. She is advancing steadily in a new direction; there is a more careful study of nature and the laws of light and shadow; and she is especially excellent

Comparison
between
English and
French art.

MR. COPE
ON
PAINTINGS
IN OIL.

in tone and completion as a whole; but, except in her objectionable nudities, pure form is comparatively neglected. The downward movement in design, predicted by Ingres as the result of "the innovation of Romanticism," is becoming manifest not only in the International Exhibition itself, but still more in the salon. While, therefore, France is improving in the art qualities of tone and colour, there is a great and growing tendency to careless negligence or shadowy and unsubstantial vagueness; and unfortunately these qualities are already beginning to be fashionable in art cliques, and to find their supporters in the French press. Art is only safe when it rests upon the solid basis of design; and if France once lets go this, her hitherto peculiar excellence, her deterioration is imminent.

In English art there is just the opposite tendency. We are now attending so much to design that our colour is in danger of suffering. The effects of the evil side of "pre-Raphaelitism" are also apparent in a certain littleness of treatment in many of the pictures; while in others there is to be observed the reaction from this to the other extreme, and the result is careless sketchiness. Compared with the art of France many of the English pictures look white, and are deficient in tone and in completion as a whole, while individual parts are too much emphasised. Especially is this the case in the landscape art of some of our younger painters.

Another observation suggests itself. While the English pictures of poetical, episodic-historical, domestic *genre*, and landscape subjects are conspicuous for excellence and variety in aim and treatment, there are no pictures of national importance. All the works contributed have been collected with great difficulty from private houses, and are of small proportions. The foreigner inquires, "Has England no history-painters? Where are the works, on a large scale, illustrating her glorious achievements on land and water? Where are the works contributed by her Government?" The Englishman replies, "There are none." An effort was made, under the auspices of the "Good Prince" Consort, to open a wider field for historic art in fresco painting; but after his untimely removal the "Royal Commission of Fine Arts" was abruptly dissolved, and the short-lived impulse came to an end; while in oil painting nothing whatever in the way of noble employment has been attempted.

In fact England has (strictly speaking) no national collection of oil pictures, for the Sheepshanks and Vernon

England
has no
national
pictures.

Galleries mostly consist of cabinet gems suited to the dimensions of drawing rooms, and were collected by private gentlemen, and afterwards bequeathed to the nation. While, therefore, France has been able to contribute no less than 252 state pictures alone to the Exhibition, England is represented by 152 cabinet specimens only, frequently very unimportant examples, all which are sent by private individuals. This will afford some ground of comparison between the two countries with respect to the fostering care by their respective Governments for art of the highest character.

MR. COPE
ON
PAINTINGS
IN OIL.

Governmental apathy.

The shortcomings of English art in respect of history painting may be in a great degree traceable to the absence of all encouragement in themes of national interest and dignity on a large scale of those subjects which a Government alone can command. The efforts of her painters must be supported by the enlightened encouragement of a national enthusiasm and a due and discriminating employment; and until this is afforded them the artists are not to be blamed for exercising their talents in those directions which alone are at present open to them.

Mr. Cooper
of
Lancaster
in 1851.
—
Government
of
Lancaster

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It is not however sufficient to point out the deficiencies of our art, but we must also show the means of improvement. The first of these is to be found in the selection of subjects for painting. The artist should be encouraged to paint on a large scale, and to choose subjects of national interest and dignity. The second is to be found in the selection of the subjects for painting. The artist should be encouraged to paint on a large scale, and to choose subjects of national interest and dignity.

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REPORT ON MINIATURES, WATER-COLOUR PAINTINGS, PASTELS and DRAWINGS of all Kinds; PAINTINGS on ENAMEL, EARTHENWARE, and CHINA; CARTOONS for STAINED GLASS and FRESCOES; and MOSAICS.—(Class 2.)—By J. C. HORSLEY, Esq., R.A.

MR. HORSLEY ON
MINIATURES, &c.

THE following remarks are not to be considered as an exhaustive report upon the various objects included in Class 2; but only as general observations upon the condition of the arts represented, such as may suffice to direct attention to those specimens which are most remarkable for the artistic power and taste displayed, without special reference to purely mechanical skill or excellence of manufacture.

The works under consideration are distributed as follows:—In “Miniatures and Water-colour Paintings” England alone makes any display of importance. There is a fair show of “Pastels and Drawings of all Kinds;” “Paintings on Enamel, Earthenware, and China,” are generally and fully represented; whilst “Cartoons for Stained Glass and Frescoes” are contributed by Bavaria, Prussia, and Belgium only. In mosaics the examples are few, but highly interesting.

It will, perhaps, not be out of place before considering in detail the specimens in any one of the arts represented, to refer briefly to the principles which should govern its treatment.

Commencing, then, with “Water-colour Paintings, including Miniatures,” it is hoped that the great importance of the subject will excuse the following prefatory remarks:—

Water-colour painting, or, rather, to use the older and far more appropriate expression, water-colour drawing (that is, drawing upon paper with transparent colour ground in water), may be said to have been brought to maturity in England in the latter half of the last century, and, after producing many admirable artists, it attained its highest excellence in our own time, in the works of Turner, Cox, Dewint, Hunt, Copley, Fielding, and others—Turner being, beyond question, the greatest of all water-colour draughtsmen. It is in England only that a school of water-colour artists ever existed; and it is to England alone that we must apparently look for the continued practice of an art the results of which are universally admitted to be an honour

Prefatory
remarks on
water-
colour draw-
ing.

MR. HORS-
LEY ON
MINIA-
TURES, &c.

Turner's
opinion and
practice as
to the use
of opaque
colour.

to our country. It is, therefore, a serious subject for consideration to notice that scarcely one pure water-colour drawing, unpolluted by opaque colour, is now produced.

The following anecdote shows what Turner's views were on this point:—Three or four years since, the writer of this report was looking at some of Turner's exquisite water-colour drawings in a London sale room, in company with one or two distinguished members of the old Water-Colour Society, and ventured to draw their attention to the fact that Turner never used opaque colour in his finished water-colour drawings, and also to suggest that its use was the cause of the generally-admitted deterioration in the works of modern water colour draughtsmen, as compared with those of the great artists named above. At the close of these observations, a voice (from one hitherto unobserved) said, with a strong Scotch accent, "You're just using Turner's own words." The speaker proved to be the late Mr. Monro, of Novar, formerly an intimate friend of Turner, and the possessor of some of his most precious works, both in oil and water-colour. He then said that the only occasion on which he could remember Turner showing any excitement or animation in conversation (he was generally a man of very few words) was at the time the use of opaque colour in water-colour drawings was first introduced; and, meeting Harding and some other artists who had adopted the practice at Mr. Monro's, he not only reprobated in the strongest terms the course they were pursuing, but asserted emphatically that if persisted in it would prove "the ruin of the art of water-colour drawing." These, as Mr. Monro said, are "Turner's own words;" and who will question their importance and the vital truth they contain?

Turner in his practice showed how entirely he appreciated what may be termed the genius of the materials he used. Just as in oil he never failed to take advantage of its power of solidity combined with transparency, so he never sullied the lovely quality of transparency in water-colour—its very essence and spirit—with opaque mixtures. It is as great an error in artistic practice merely to stain a canvas with thin washes of oil colour as it is to pollute water-colour with opaque mixtures; and when the moment arrives that a water-colour draughtsman finds he cannot give expression to his artistic feeling without the use of solid colour, let him at once become an oil painter or work in distemper. The use of splotches of permanent white (a great misnomer, by the way) amidst transparent water-colour is as incongruous and inharmonious in its results as is the ruling of skies by machinery, combined with hand work, in modern engraving.

It has been just observed that the term "permanent white" is a great misnomer, and this opens up a question of very serious import to the possessors of drawings in which it is much used. A short time before the death of that great artist, John Leech, during a discussion at his house upon the question now under review, he exhibited a proof from a wood engraving of one of his inimitable designs, upon which he had worked with permanent white, obtained from one of the best makers, and had then placed in a drawer. Upon taking it out some few weeks afterwards, he found that the vaunted permanency of the material was short-lived indeed, and that almost every one of his touches in white had turned black from having been kept unexposed to light. It would appear, therefore, that the owners of drawings in which opaque colour is used should be careful not to keep them long covered up, and should beware, also, of any accidental blows or jarrings, since, when used in large quantities, this very permanent material is apt to crack and peel off.* It is also injuriously affected by moisture in the atmosphere.

This is no place to sing pæans in praise of Turner, a theme which is ever upon the lips of all lovers of art, and which has given birth to some of the most eloquent of modern literary compositions; but it is quite within the range of an endeavour to assert the true principle of water-colour drawing to urge upon art-students a constant study of Turner's works, and it may be with truth asserted that in no one of his completed drawings will a touch of opaque colour be found.

He occasionally, though very rarely, used it in his sketches from nature, where he desired to get with the utmost rapidity the effect which at the moment impressed him; but these sketches were almost always made upon tinted paper, where the necessity for using opaque white may be said to be absolute.

It is to be feared that the temptation to produce drawings with rapidity and comparative facility has been the chief cause of the general adoption of a practice which Turner pronounced to be so pernicious. A water-colour draughtsman who cherishes the pure and beautiful ground he works upon for his lights, or, if he has lost this, scrapes or washes them out, has a far harder and more anxious time of it than he

* Pure water-colour drawings should always be protected from unnecessary exposure to light, and kept either in portfolios and cases, or, if framed, should have curtains to draw over them occasionally. But this, it would appear, is the reverse of the treatment required by opaque mixtures. Therefore it would seem difficult to take due care of drawings which are a combination of the two materials.

MR. HORS-
LEY ON
MINIA-
TURES, &C.

who, by the aid of opaque mixtures, dabs them on in a moment and renews them at pleasure. It may, however, readily be conceded that another and worthier reason for the use of opaque colour is the yearning of the artist to have substance and solidity in his material; but, as has been remarked above, when he feels this, and that he is flagging in devotion to those qualities of art which water-colour, and water-colour alone, can produce, he should become an oil painter, and cease to be a water-colour draughtsman.*

The art of pure water colour is entirely free from that element of evil which is an enduring source of vexation to every true painter in oil, and to get rid of which his choicest devices are put in practice—namely, the sense and look of the material paint, and some of the loveliest effects in nature are far more touchingly and truly rendered in water colour than in oil.

It is a trite remark to say that there is no rule without an exception; and it would not be right to quit this subject without calling attention to the practice of William Hunt—one of the greatest amongst the great men already referred to. During the latter years of his life, and especially in his marvellous studies of fruit and flowers, there is no doubt that he used opaque colour freely, but in a manner and with a skill entirely his own. In his drawings there are no dabs and splotches; but the opaque stuff is so hidden up and carefully blended, that, without minute examination, you

* The vain attempt to combine the qualities of transparent and opaque colour may possibly have led to an error in taste and judgment on the part of modern water-colour draughtsmen, which, as it is confined entirely to English artists, should not pass unnoticed. The error referred to is that of framing drawings like oil pictures—that is to say, without marginal mounts. That this is a fault seems to be tacitly acknowledged by the artists themselves, for there are many drawings in this Exhibition which have been previously seen in England at the various water-colour societies, framed up to the edge, that now appear upon wide mounts, and are consequently greatly improved in effect. The whole system of gold frames has frequently been thought to be questionable, the mass of yellow glittering surface having certainly an unpleasing and injurious effect upon the exhibition walls. It has been more than once suggested that a return should be made, if only partially and experimentally, to the use of black frames, or black with a slight admixture of gold, such as inclosed the great works of the Dutch and Flemish painters. At any rate, it will be generally conceded that the delicate hues of water-colour have not power to contend with the garishness of gold frames richly ornamented, and that drawings are always greatly improved by that separation from actual contact with the frame which a mount ensures. It has been urged that there would not be space in the various Exhibition rooms for mounted drawings, but there is a ready answer to such an objection. Let the width of frames in present use be in no way increased, but utilized thus:—Give half or three-quarters of an inch to a simple gold bead, and devote the remainder of the space to mounts of any toned white thought to be generally suitable. It may be noticed that every foreign water-colour drawing in the present Exhibition is, without exception, mounted.

scarcely detect its presence. But, beautiful as these works are, and speaking with the utmost reverence of such a genius as Hunt, a comparison between his former and latter styles would show the great and undoubted superiority of his earlier work in pure and refined artistic qualities.

MR. HORSLEY ON
MINIATURES, &c.

The very exceptional nature of Hunt's practice in this respect is clearly shown by comparing it with that of one as great as he, David Cox. It may be truly said that every touch of opaque colour in the drawings of this admirable artist now exhibited gives a pang of grief to the spectator, marring and blurring, as it does, his otherwise beautiful workmanship.

It remains only to express a fervent hope that a revival of the pure art of water colour may not be far distant—the art as it was practised by Turner and by his eminent predecessors and contemporaries, and one which it has been the special glory of England to have originated and fostered. Might it not further such a desirable consummation if there were occasional exhibitions in London of what may be termed the old masters of the water-colour school? What treasures of art would then be revealed! Perhaps the object in view would be still more effectually promoted by a combined exhibition of the old and new styles. May those who have time and zeal for such a work be induced to take it in hand!

In calling the attention of visitors to particular water-colour drawings and miniatures in the Paris International Exhibition especial reference will be made to the mode in which the principles above referred to are carried into practice. It is, however, to be borne in mind that this report is in no way intended as a catalogue raisonné or complete handbook, and that it has been requested that foreign contributions should be more dwelt upon than those from England.

Water-colour drawings in the Exhibition.

It is not a little painful to be obliged to commence the task of criticism by saying, that amongst all the water-colour drawings exhibited, one by a French artist and a few from Russia (to be noticed presently) are the only pure examples to be found. It is difficult to select any of the foreign landscape water-colour drawings as worthy of special remark, except, perhaps a drawing by Felix Ziem (No. 624* in the catalogue, French section.) This

* Unless the French catalogue has been much improved and corrected since the month of May, but little reliance can be placed upon it. The catalogue of the British section, printed for Her Britannic Majesty's Commission, is a model of good arrangement and accuracy.

MR. HORS-
LEY ON
MINIA-
TURES, &C.

is a careful and well-studied drawing, good and true in effect, with something of the real quality of light in parts, but muddy and bad where opaque colour has been used. This is especially to be remarked in the sky and water at the horizon on the left side of the drawing.

Water-
colour draw-
ings exhi-
bited by
France.

It may be here observed that it is impossible to see the French water-colour and other drawings properly, owing to the mode of lighting the French galleries, which certainly does not seem a plan worthy of imitation. It has the effect of illuminating unduly the upper portion of the walls and casting the lower part into half tone; whilst the screens in the centre (upon which the drawings are hung) are in deep shadow.

The other landscape drawings, which are few in number, are laboured and common-place. It may, however, be remarked that the French water-colour landscape draughtsmen do not ignore the qualities of light and colour after the fashion and to the extent of their brethren the painters in oil; still, there is little apparent devotion to the blue skies and brilliant sunshine with which their climate generally favours them, and it would appear that French landscape-painters positively shrink from the endeavour to paint those effects in nature with which they must be most familiar, and cling to grey neutral tones and cloudy effects such as, comparatively speaking, they rarely see. Even when they go to Italy, or to the East, they scarcely ever attempt to paint light and sunshine. How curiously different is the artistic purpose and endeavour amongst more northern painters! Think of Cuyp and De Hooghe, and how Turner set the sun in the heavens he represented! How comes it to pass that the mist-laden and fog-shrouded painters of Holland and Great Britain should be for ever pursuing that artistic will-o'-the-wisp, the endeavour to paint light; whilst the Frenchman, who can reckon on several months in the year of constant sunshine, delights in tones and hues of the sombrest kind—many of his landscapes looking like nature seen through a smoked glass? Perhaps it is the old story of familiarity breeding contempt; and thus, whilst the former make the most of those gleams of sunshine occasionally vouchsafed them, the latter grasp at effects of cloud and gloom that they rarely see. Amongst the French figure drawings the pure work already alluded to is by Tourny (No. 596 in catalogue), the subject, two monks at a bénitier, very carefully and well drawn, good in character and expression, and the colour unobjectionable. It appears to be completely free from opaque colour, and thus gains immeasurably in quality. Pils' sketches of military life and action are clever and characteristic, but marred

by an extravagant use of the opaque abomination, remarkable even in a sketch—skies looking like plastered walls, where a wash of transparent colour would have given the true aerial effect.

MR. HORS-
LEY ON
MINIA-
TURES, &c.
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Eugène Lami is one of the few artists in France who has much reputation as a water-colour draughtsman, but it is presumed that the two drawings he exhibits (391 and 392) are not to be regarded as good examples of his talent. There seems, indeed, but little general interest felt about the art of water-colour in France, or there would be more evidence of it, both in the number and character of the drawings exhibited.

But before closing this notice of the works of the French water-colour artists, it should be mentioned, as a fact honourable to them, that there is scarcely a trace of that vicious choice of subjects so unhappily rife amongst the French painters in oil.

In miniatures the French exhibit many well drawn and painted works, but with a total absence of good colour, though free from the hard and black appearance of most of their portraits in oil. The miniatures by M. Fenlard (248), Mdme. Juliette de Bourge (78), and Mdme. Eugénie Morin (486 and 487) are worthy of notice, and it may be observed how superior in quality are the two works last named, where no forcing of the material is apparent, over another work by the same artist (488), where opaque colour has been introduced. To endeavour, by forcing water colour, used upon ivory, beyond what may be termed its natural strength, and by the use of gum and body colour to make it contend in power with oil, is as fatal a mistake as sully water-colour drawings on paper with opaque colour.

Amongst the water-colour works of other countries a highly ornamented “*Missale Romanum*,” exhibited by the Academy of Fine Arts at Vienna, must be included. Though a most elaborate work, it calls for little remark, save for the completeness with which it is carried out. The subjects in miniature which adorn it will doubtless appeal to the devotional feelings of Roman Catholics, but as works of art they have not the inherent beauty necessary to enlist general interest. There is a good deal of merit about the water-colour sketches of Rodolphe Alt, and they are less sullied with opaque colour than many.

In the Pontifical States there are drawings by Gigante and Pallizzi with cleverness and character about them. One of a Neapolitan *corricolo* is an amusing illustration of the way in which these vehicles are packed with their human freight, unlicensed as to numbers, it is presumed. Palizzi's

Pontifical
States.

MR. HORS-
LEY ON
MINIA-
TURES, &C.
Russia.

study of two dogs' heads is clever, but it must be confessed that it is for want of better examples to criticise that such works as these are specially referred to.

A different feeling is excited in looking at the water-colour sketches and studies by Pierre Sokoloff in the Russian section. These, though slight, are excellent in drawing and character, and are to a certain extent effective in light and shadow, and colour. They are also distinguished by an entire freedom from the use of body-colour. "Peasants Leaving a Village in Winter" is especially worthy of observation, and also an "Innyard." They are the more interesting as they are evidently truthful representations of Russian peasant life and character. For this quality the drawings of Kossak may be looked at with interest, but they do not possess the artistic feeling of those by Sokoloff.

Sweden.

In the Swedish section there is a good and careful drawing of the interior of the church at Floda, by Schölander, apparently pure throughout.

Greece.

In the Greek Court there are two drawings of Athens, of moderate ability, and in the Bavarian annexe there are careful water-colour sketches by Klein.

China.

And now, not omitting to notice the distemper paintings from China, where the charms of the ladies are heightened by having their under lips painted green, the foreign contributions in water colour may be said to have been fairly sifted. It is only right, however, to repeat that the notice of many of these works is mainly due to the paucity of productions to be commented upon.

England.

It remains to speak briefly of the English water-colour drawings—a collection which is intended, like that of the oil pictures, to show the condition of the art during the last 10 years, and which, doubtless, would have accomplished this more effectively in both departments had the various art-collectors in England been more willing to part with their treasures for the purpose. It is impossible, however, on due reflection, to join in the reproaches occasionally applied to these gentlemen. They suffered much, on previous occasions, at Paris, Manchester, London, and Dublin, by stripping their walls of their chief ornament, and subjecting their pictures to great risk and some injury. It should, therefore, be no matter of astonishment that so many of them declined to be victimised a fifth time.

Still, the exhibition of English pictures and drawings in Paris has been entirely supplied from private sources, whilst that of France is to a very great extent contributed by the State.

The English water-colour drawings can scarcely be said to represent satisfactorily the present condition of the art in England, though there are some admirable works which have already elicited high and deserved commendation in England. It is not necessary or desirable to criticize them in detail, but the whole collection deserves careful inspection, and any comparison between it and that of other countries is rendered impossible from the unquestionable superiority of the English drawings. Would it could be said they were drawings in pure water-colour!

But though the search for one pure drawing will be made in vain, some may be discovered in which the use of opaque colour is but slight, and in that by Mr. Bennett, "Richmond Hill—Sunset" (5), there appears to be scarcely a touch of it, except upon the figures. Why so excellent an artist as Mr. Bennett, who evidently appreciates the real charm and virtue of the material he uses so skilfully, should have used opaque colour at all is difficult to understand. He cannot but admit that, if he had allowed his paper to tell for the light he required about his figures, the quality of that portion of his work (small and comparatively insignificant as it is) would have been infinitely better, and more in harmony with the rest of the drawing than is now the case.

The same remarks will hold good with every drawing in the collection. In Mr. Newton's admirable contributions it is a positive grief to see snow shadows and other portions of his beautiful work deprived of so much of their purity by the use of opaque material—points that Turner would have rendered with the utmost charm and truth by means of the most precious transparent colours. In an excellent little drawing by C. J. Lewis, "Evening," there is a positively wanton use of opaque white, especially in the reflection of the sky in the water, where the paper, tenderly used, would have given the desired effect with infinitely greater truth and beauty. So in an effective drawing by Mr. Whymper, "Hurried Loading," why should the haymaker's shirt be loaded with lumps of opaque stuff, when the paper left would have done all that was required? In the excellent drawings exhibited by Messrs. Goodall, Brittan Willis, A. W. Hunt, M. Kewan, Whittaker, and a few others, there is comparatively little use of opaque colour, but what there is gives a commonness to the portion of the work in which it appears, and to a great extent injuriously affects the whole drawing.

Leaving many admirable works, full of spirit and beauty to speak for themselves, the fact must not be unrecorded

MR. HORS-
LEY ON
MINIA-
TURES, &c.

that those truly great artists, David Cox and William Hunt, now passed away from amongst us, are represented in the collection. There are four drawings by Cox, made when mind and hand were failing one of the best artists our country ever gave birth to. Still they have much of the old fire and charm of pure water-colour art in them. The few touches of opaque colour introduced are, as has been before said, painful to see, not only because they soil pure and good work, but because you trace in them manifest proofs of uncertain sight and hand. Those blurrings in the shadow under the bridge and upon the road, in the drawing of "Going to Market," and on the rocks and foreground in some of the other drawings, are such as Cox would never have defaced his work with in his time of health and vigour.*

There is only one drawing by W. Hunt, an admirable study of a dead peacock, No. 59, in which there would appear to be but little use of opaque colour; at any rate, it is so concealed that it would be difficult to assert its presence, except in some touches of white in the head of the bird. There are beautiful miniatures by Wells and Moira, which all foreign miniature-painters might study with advantage to themselves, especially for clearness and truth of colour and delicacy of execution.

In concluding these remarks upon water-colour art and the examples now exhibited, and in venturing to call in question the practice of men of undoubted genius and artistic ability, and to warn them lest Turner's prophecy should be fulfilled, the writer of this report (however deep may be his interest in a revival of the beautiful art of water-colour drawing), would scarcely have written as he has done but for the support of Turner's expressed opinion and practice. He feels that in the mere shadow of such a tower of strength he may rest in safety and insignificance.

In speaking now of pastels and drawings of all kinds no especial reference to any acknowledged principle of art is called for, such works being generally confined to studies from nature, preliminary designs for important works and portraiture.

First, beyond question in this section, both in interest and excellence, are the studies by Hippolyte Flandrin for his

Pastels
and other
drawings
exhibited by
France.

* In the whole history of water-colour art you can point to no purer or better specimens than the drawings of David Cox; and he is also an example of an artist putting aside his water-colours and becoming an oil-painter, when, as it would appear, he craved for a more powerful and solid material by which to express his artistic feeling. During the latter years of his life he devoted himself almost entirely to painting in oil.

great mural works in the church of St. Germain-des-Près; indeed, there is nothing in the whole range of French art now exhibited to be compared with those drawings for true artistic excellence and elevation of feeling. Flandrin was, without question, the greatest painter of sacred history of our time. When tired by the din and glare of the Exhibition, disgusted and offended with pictures appealing to the worst passions of humanity, nothing more refreshing both to mind and body can be conceived than to spend an afternoon in the churches of Saint Germain-des-Près and Saint Vincent de Paul, both of which are filled with Flandrin's works. No art-lover should quit Paris without doing this. The two subjects in the choir at St. Germain-des-Près—the one “Our Lord's Entry into Jerusalem,” the other “the Procession to Calvary”—are more than sufficient to make the reputation of a great artist, and every composition and single figure upon the walls is worthy of admiration, and will repay careful study.

The three frames of Flandrin's drawings now exhibited contain each a photograph of one of the compositions in the nave of St. Germain-des-Près, and five separate studies for figures introduced in these compositions. The ordinary visitor might easily pass them over, but they merit the most earnest attention. Each figure is an example of unaffected action and pathetic expression. That of St. John, for instance, in the subject of the Crucifixion is simple in pose but intense in feeling. So with the Magdalene and the other holy women at the foot of the cross. The head of our Lord, too, in the same frame is admirable. No contrast can be conceived greater than that between the taste and style of Flandrin and that of almost all other modern designers of sacred subjects. Unlike the Germans, who look at art and nature through other men's eyes, Flandrin is as original as he is truthful. Unlike other French and Belgian artists, who delight in posing their principal figures in the most studied and affected actions, Flandrin's works are entirely unforced, and seem to proceed direct from a heart imbued with the deepest feeling for the subject he is treating. There can be no greater pleasure than to be able to appreciate thoroughly and to praise heartily the labours of other men; and this pleasure can surely be enjoyed to the full by all who study the works of Hippolyte Flandrin, now gone to his rest and to that more perfect communion of saints with whom (judging from his works and known life and character) he must have ever lived in thought on earth.

What a contrast to turn from the works of Flandrin to those of Bida, who exhibits twenty-eight drawings illustrating

MR. HORS-
LEY ON
MINIA-
TURES, &C.

the works of a modern French novelist! These are executed with great facility in chalk and Indian ink. Amongst the best is that of a young woman reading to a man at a supper-table, by lamplight, with an old woman asleep in a chair. Another is that of a man sitting by the side of a sick-bed, and some Turks bargaining for a Circassian slave. The drawings of "The Massacre of the Mamelukes" and "Solomon's Wall," also by Bida, are works of a higher character, and are full of merit. The pastels of Galbrund are remarkably excellent, as far as it is possible to judge of them in the light in which they are hung. Both in drawing, expression, and use of the material, these works are well worth attention; and it is hoped that before the close of the Exhibition they will be better placed. The studies of fruit and flowers, by Chabal-Dussurgey, executed in chalk and body colour, are excellent examples, and well worthy of being better seen. There are three portrait drawings, by Paul Flandrin (brother of the great painter), very carefully rendered, but in a somewhat dry and uninteresting style. Other French drawings are scattered about, but none demanding especial comment.

Bavaria.

In Bavaria there are drawings, by Adamo, called "Un Roman en cinq tableau," very mannered and ugly, and with a story of little interest. Others, by Pixio, are extremely common-place.

Denmark.

In Denmark there are some good drawings of heads in chalk, touched with water colour, by Fröhlich, especially the head of a boy in chalk only. It may be observed that there is great simplicity and earnestness in the works from the far north—Russia, Denmark, and Sweden, for instance—qualities of greater worth than the boasted "chic" of more advanced schools.

Nürnberg.

There is a remarkable display of drawings, both for numbers and general ability, sent from the "Kunstgewerbschule Nürnberg." These are in the Bavarian annexe outside the Exhibition building, and consist of scholastic drawings and models, representing the various stages of study from the cast and from life; also architectural models and drawings—all showing a very high condition of efficiency, both in the method of instruction which produces such good academic results and in the industry and skill of the students. A few designs are shown, but nothing of note. It is somewhat disheartening to find such good training producing so little fruit; for there is but feeble vitality in most modern German art. There is a complete and most interesting collection of the works of the students at the schools of the Department of Science and Art at South Kensington fully illustrating the excellent system pursued and its highly satisfactory

South
Kensington
Schools of
Art.

results. The objects aimed at and accomplished in our English school are much more extended than those at Nuremburg.

MR. HORSLEY ON
MINIATURES, &c.

Passing on to "Paintings on enamel, earthenware, and china," it seems necessary to bear in mind not only the principles of art that should be applied to these various branches of industry, but also to suggest that a peculiar abstraction of mind is in some instances requisite in order to appreciate the results, as far as the art of pictorial design and execution is concerned. Take for instance, what, it is presumed, would be considered the highest class of enamel works in the exhibition—those by Lepec and Rudolphi, who exhibit enamels on gold and other metals. The pictorial art introduced in these works is both puerile and bad, as, for example, the "*Angélique et Roger*," by Lepec, which is placed amongst the French miniatures (No. 430). Nothing can be less worthy of regard in an artistic point of view; and his portrait (431) is little better. Lepec has also a case of enamelled vases, tazzas, &c., executed with the rarest skill and ability, with fabulous prices attached to and given for them, yet the painting which is intended to ornament these "*objets de luxe*" is quite beneath notice.

Painting on
enamel,
earthen-
ware, and
china.

France.

Again, look at the series of elaborate enamels in porcelain in the Bavarian annexe, by Wimmer, of Munich, and other German artists, after well-known pictures. What are these but wretched copies of immortal works, so bad as to be irritating to the artist who looks at them—copies which, if made on canvas or paper, would not fetch as many pence as the pounds which are now given for them! Then, what quality is it that makes these productions so readily marketable? It can be only that of permanency—a quality appealing to minds so constituted as to derive satisfaction in the possession of the "*Angélique et Roger*" of Lepec or one of Wimmer's travesties of Raphael or Rubens simply because they are works which will never tone with age or fade with time.

Bavaria.

There is, of course, no reason why better art and artists should not be employed upon enamel work; but still, from the very nature and hazard of the processes employed, the power of the material is limited, and the result of its use far from satisfactory in an artistic point of view. This is proved, if proof be necessary, by reference to the enamels of Messrs. Gray and Ford, hung with the English pictures and water-colour drawings. These are, beyond question, the best specimens of enamel-painting in the whole Exhibition; indeed, it would be absurd to draw any comparison between them and those by Wimmer and others.

England.

MR. HORS-
LEY ON
MINIA-
TURES, &C.

The German enamels have not the slightest real resemblance to the pictures from which they profess to be copied, whereas Mr. Gray's copies, after Mulready, have much of the very touch and character, as well as colour and drawing, of the original work. Yet a water-colour copy by Mr. Gray, upon paper, would be immeasurably more valuable and interesting, since it would be free from that glazed and glossy surface which seems to fuse into monotonous equality every portion of the work, and those hot tones of colour, the result of occasional and inevitable over-firing, with other failings, evident to an artist's eye. Great as may be the charm to some minds of the sense of permanency, it must be permitted to those of more artistic sensitiveness to assert that this quality does not compensate for other wants. It is scarcely necessary to add that it is only to enamel paintings, pictorially considered, that these remarks are intended to apply. Reference to the elaborate ornamentation and perfect workmanship found in the works of Lepec and Rudolphi would lead to remarks of a totally different character to those now called for.

Under the same class of work as that just commented upon may be placed the porcelain plaques exhibited by various manufacturers, such as the landscapes by Bouquet, and the figure-subjects of Lessore (exhibited by Messrs. Wedgwood). These are framed as pictures and sketches in oil or water-colour would be, and it is presumed are intended to vie in interest with such works. Viewed in this light these plaques are all but worthless, save for an occasional agreeableness of tone and depth of colour, and it needs a strong appreciation of the quality of permanency, and knowledge of the difficulties of execution overcome, to set any value upon these productions. To come to what may be termed "painting proper" upon porcelain, *i.e.*, the decoration of vessels of various forms for ornament and use—it may be submitted that the general principle to be observed in applying art to such work is that it should harmonize in every way with the forms which receive it. As these forms are of a well-defined and architectonic character, so the pictorial adjunct should, as far as possible, partake of the same qualities. Thus, speaking broadly, all landscape subjects and those requiring picturesque treatment are undesirable and incongruous with reference to the object in view. Occasionally in the present Exhibition you will come upon a vase on which a landscape is painted which, commencing on the body of the vessel, is made to meander (trees, sky, buildings, and all) over the concave and convex forms to be found at its neck. Can there be a more absurd

Painting
upon por-
celain.

departure from true taste in ornamentation than such an example as this? Again, in the Sèvres court there are tea services considered so rare in quality of manufacture as to be placed in an elaborately-made case, in which there is a safe haven formed for every separate piece of the set. Now, examine the tray at the top of the case (203) painted by M. Langlois. You will find it tasteful in form, with an edging of beautifully painted and gilded ornament, and in the centre a commonplace-looking landscape in monochrome—as a work of art, little better than those well-known “ruins” and “views of noblemen’s seats and castles” which adorn the commonest earthenware of domestic use in England. This kind of work is surely inharmonious with the setting which encloses it. There is much of this questionable taste and indifferent painting to be seen in the Sèvres court.

As examples of the error committed in introducing upon set forms picturesque subjects, executed in a slight and sketchy manner, the work of Demoi (Belgium) and Rischgitz (Minton’s court) may be cited. It is only fair, however, to say that, though Messrs. Minton exhibit this work, they neither approve it nor propose to continue its production. Figure-subjects where the background, be it landscape or architectural, is secondary, groups of trees, flowers, and animals (a frequent recourse being made to the vignette treatment where the fair porcelain ground is shown) seem the subjects most fitted for porcelain decorative purposes, arranged, as they should be, with a certain amount of conventional symmetry in harmony with the forms they are intended to ornament. Certainly, in porcelain-painting any contention with pictures or picture-making should, as far as possible, be avoided.

Copies from and adaptations of Boucher and Watteau are the stock in trade with most manufacturers. A change from the worn-out common-place nudities of Boucher would be a great relief; but Watteau’s works are, without doubt, admirably suited for porcelain ornamentation. It would be well, however, if the artists employed would study more deeply the style of this admirable painter and try and imitate in some degree his piquant touch and charm of colour, qualities which are now conspicuous by their absence in all copies on porcelain after Watteau made either at home or abroad. It is certainly worth the consideration of manufacturers whether these sources of supply might not be extended. The designs of our own Flaxman and Stothard would yield excellent subjects, and those of the former are particularly applicable to that Néo-Grec style

MR. HORS-
LEY ON
MINIA-
TURES, &c.

now so much in vogue in Paris, and which, possibly, may obtain favour in England before long.

There is, apparently, little resort in any country to original design for porcelain ornamentation; and this doubtless arises from the difficulty of inducing eminent living artists to make designs for art manufactures; but a delightful little work in Minton's court, executed from a sketch by Mr. Stephens (the sculptor who is engaged upon the Wellington monument), makes one hope that the experiment of applying good and original art may be repeated.

Porcelain
from Eng-
land.

Reference in general terms only can be made to the porcelain displayed throughout the Exhibition by various countries. The visitor will judge for himself as to the way in which the principles hinted at above are carried into practice. If he be an Englishman he will feel proud to see how the display made by Minton, Copeland, Wedgwood, and others proves itself to be inferior to none. Indeed, in many qualities the show made by these manufacturers is unrivalled. In porcelain-painting there is nothing better than the works of Allen, Mitchell, and Simpson, artists employed by Minton; and that of Jahns (a German artist engaged by the same firm) is highly to be commended.

The exquisite finish and detail in all that Minton shows is remarkable, and exhibits in the highest degree that thoroughness of execution in which first-class English work stands supreme. The same may be said of the specimens shown by Messrs. Copeland, where the painting of Hürten, Smith, and Lucas is remarkably good. Messrs. Wedgwood make an admirable display. They seem to have caught the true spirit of the old work with which their name is so inseparably connected.

It is a curious contrast to see, hung side by side with that exquisite ware, the daubs on china by Lessore. Be it from what cause it may, whether owing to superiority in some qualities of the "pâte tendre," which the English use over the "pâte dure" of the French, it is certain that there is a clearness and power in the English porcelain-painting which is not found in the work of other countries. Though the English copies after Watteau are far from what they might be, they are better than those produced by his own countrymen.

France.

The great display in the Sèvres court, and the beautiful specimens it contains, merit, of course the closest attention; but the monotony to be observed among the French pictures, the result of too rigid devotion to the scholastic system, seems equally apparent in their porcelain-painting; and they shrink from the effort to obtain force and brilliancy, qua-

lities which are certainly to be had without drifting into coarseness and vulgarity. This is shown by looking carefully at the large vases of Minton and Copeland, and comparing them with those numbered 56 and 57 in the Sèvres court.

Outside the Sèvres court there are some colossal figures, from designs by the artist Yvon, painted upon slabs of porcelain rudely joined together. It is presumed that this is an experiment in decoration, as a substitute for the more costly mosaic or fresco of uncertain permanency. In this light they are highly interesting; and if they are bonâ fide enamels upon porcelain, and can be produced at a moderate cost, the experiment might be extended with advantage, as they have much of the fresco look about them, and are not burdened with the difficulties of execution and disagreeable shine and glitter of mosaic work.

The faïences of Deck and Jean deserve particular attention, especially those of the first-named artist, which are admirable in style and execution, but the qualities which their works exhibit, are not those of strictly a pictorial nature.

A new process of enamelling in lava (as it is termed) may be noticed, but the results are not gratifying in an artistic point of view. Some heads which are to be found among the porcelain collection of Gillot are the best examples. There is a group of Queen Victoria and the Prince Consort which really should not have been admitted into the Exhibition.

The painting on glass, exhibited by the Compagnie des Cristalleries de St. Louis, Cristalleries de Clichy, and Compagnie des Cristalleries Baccarat, must not pass unnoticed. The two first named exhibit some excellent painting of fruit and flowers, especially to be observed upon the vases from St. Louis. There is a large tazza-shaped vase with figures in monochrome on a blue ground, sent by the Compagnie Baccarat, which is excellent in style and execution. The painting generally of these glass works certainly deserves attention. There is, however, very questionable taste occasionally displayed, as the cache-pôt exhibited by Baccarat, which is of the simplest possible form, painted all over, with a gold rim at the top, but without moulding of any kind to relieve or ornament it. This is placed on a high stand of white glass, elaborately varied in form, without a particle of colour or gilding upon it. The effect of the whole is incongruous and bad.

There is but little to admire in the German porcelain-painting, though it makes a great display as far as quantity goes, but nothing to call for especial remark in the painting, which is generally common-place in execution and tasteless

Austria.

MR. HORS-
LEY ON
MINIA-
TURES, &C.

in subject. From Meissen there are some subjects of a Flaxman-like character, which have a good effect. Austria has the temerity to exhibit a conspicuous failure in the endeavour to reproduce literally a beautiful service, by Minton, purchased by Queen Victoria, in the 1851 Exhibition, and presented to the Emperor of Austria.

The wanderer round that world of care and labour, the gasometer in the Champs de Mars, will find much and varied interest in the exhibition of porcelain, and certainly among other contributions will not fail to notice the Doccia ware of Cinori.

The East.

An opportunity is also afforded for comparing the porcelain work of the West with that of the East, in specimens from India, China, and Turkey, both ancient and modern work, but there is nothing further which deserves especial notice in a pictorial point of view, and we may proceed to the consideration of cartoons for stained glass and frescoes.

Cartoons for
frescoes.

We will take the most important branch first, and speak of cartoons for frescoes, though perhaps not a single example of such a work exists in the Exhibition, as it is not probable that any one of the designs exhibited for mural decoration will be executed in real fresco—"buon fresco," as the old Italians called it.

The true
nature of
fresco.

It will perhaps not be considered out of place if a few words are prefaced in explanation of what fresco-painting really is, as there is a wide-spread misapprehension on the subject; every wall painting, be it executed in common distemper, wax, water-glass, or oil, being indiscriminately termed fresco by a great majority of those who have more interest in than knowledge of the subject. "Buon fresco," that pictorial process by which the greatest effects of artistic genius have been realized—the stanze of the Vatican and ceiling of the Sistine chapel, for instance—has a peculiar property of its own, which eminently distinguishes it from all other methods of painting. It is this, that a fresco is a non-absorbent of light. The fresco ground is composed of certain proportions of lime (from which the heating element has been to a great extent washed out) and sand, and this mixture is used by the painter in its moist state. The wet lime, absorbing carbon from the atmosphere, becomes carbonate of lime, and, in combination with the sand, produces an impermeable cement, which is formed over the surface of the ground during the day's work, and in which the colour used is incorporated and fixed.* This cemented surface has

* A fresco-painter can only proceed with small portions of his work at the same time. A fresco in progress is like a child's dissected map, made up of pieces of all shapes and sizes, which are joined together day by day.

been stated to be sufficiently crystalline to reflect light. But, whether this is so or not, its non-absorbency of light is unquestionable.

MR. HORS-
LEY ON
MINIA-
TURES, &c.

It will thus be readily understood how eminently fitted fresco-painting is for mural decoration — especially for churches and public buildings, generally imperfectly lighted, and which are positively made lighter by fresco decoration. Where an oil-picture would be invisible a fresco is clearly seen. All other processes for wall-painting, such as water-glass and wax, suffer greatly in comparison with real fresco; but, unfortunately, this beautiful material is much affected by climatic influence, as may be seen in the condition of the frescoes in the new Palace at Westminster—a condition almost entirely produced by the bad air of that locality, vitiated, as it is, by exhalations and impurities of all kinds. It is, however, earnestly to be hoped that the rising generation of artists may be encouraged to try the effect of this beautiful material in places where, with proper care and attention, it might be proof against the humidity of our climate. As in the sprandrils of the nave arcade of many a country church you find texts upon the wall to arrest and instruct the wandering eye and mind, so might frescoes be introduced illustrating the great facts of sacred history. Mural painting might with excellent effect be introduced into school rooms and the halls and corridors of great houses! It is only in our “flourishing peopled towns,” where gaseous impurities hold their sway, that “*buon fresco*” has but a brief existence.

If we are to judge of England’s desire for mural painting by the contents of the present exhibition, our hope of the most partial realization of the above aspirations would be faint indeed. As in pastels and drawings, so in cartoons England is entirely unrepresented.

In criticising briefly the cartoons now exhibited, first in importance as to size and effort is that by Kaulbach, in the Bavarian annexe, which is called “*L’Epoque de la Reformation*.” What is to be said of this colossal work, which is a type of almost all German cartoons in the Exhibition? Of course, its academic power and skill are undeniable; but is there one touch of nature in the whole of it? Is not that single figure of St. John, by Flandrin, worth a cartload of such mere conventionalisms as these cartoons must in truth be called? It is impossible to speak of modern German artists without the greatest respect for their indefatigable industry and perseverance, of which there is abundant evidence in the present Exhibition. Still, we can but be impressed with the fact that a large portion of the work at

Cartoons
from Ger-
many.

MR. HORS-
LEY ON
MINIA-
TURES, &c.

Munich and elsewhere is in reality a great sham, and that it is not the result of the painter's own true and original feeling, but has been done to order, as a reproduction of the works of other times. Thus, the German artists have been looking at art and nature through other men's eyes—a mistake ever fatal in its results.

No one can question the power and ability of the German painters; but that their talent has been much misdirected by the influence of dilettanti kings and emperors is illustrated by the following anecdote:—Some years since there was to be seen in Kaulbach's studio at Munich a considerable portion of an acre of canvas, on which was painted "The Destruction of Jerusalem." Anything more uninteresting than this work it is difficult to conceive, and spectators turned away from it in the hope of finding something else in the room which it might be possible to admire and applaud. That hope was not disappointed, for on the walls were hung framed pencil drawings of modern life and incident, admirable in character and feeling, and full of humour. How clearly did this contrast seem to show (in the failure of the one and the success of the other) the true bent of the artist's mind; and how much it was to be regretted that he should have been diverted from it.

There is a great deal more artistic feeling and taste in the cartoon by Piloty (No. 29 in the Catalogue of the Bavarian annexe) than in Kaulbach's work. There are many other cartoons, drawings, book designs, &c., in the Bavarian collection, but nothing calling for special notice.

In the Austrian court there are cartoons of scriptural subjects, and several others of decorative figures the size of life, but all dreary in the extreme, from the utter want of interest and charm about them.

Belgium.

There is much to be admired in the cartoons sent from Belgium. Those by Guffens and Swerts deserve especial attention. In many instances the compositions are excellent, and there is occasionally great dignity in the single figures. It must be observed, however, that with these Belgian artists, as with almost all the modern historical painters (except Flandrin), there is a strange tendency to overstrain the action in the principal figures of their designs, posing them much after the fashion of an opera-singer unburdening himself of a scena. Look, for instance, at Swerts's composition of our Lord with his parents (209, Belgian Catalogue). The Virgin and Joseph are full of simplicity of action and earnestness of feeling; whilst the figure of the Child illustrates the bad tendency which has been just referred to. The same may be said of the figure of our

Lord bearing the cross in the cartoon by Guffens (202). Another cartoon by this artist, however (not included in the catalogue, but which is entitled "The Dignitaries and Merchants of the Hanseatic Towns depositing their Deeds at the Abbey of St. Michael"), is entirely free from these objectionable elements, and is an excellent example of design for mural decoration. In his composition (203) there is much solemnity of feeling, but this is marred by the studied action of the Virgin. The best single figures are those of Mercator and Ortelius, by Swerts. The apostles and saints designed by Guffens are very carefully drawn; but there is too much exaggeration of expression in the heads, and *posé* look in the action of the figures.

MR. HORSLEY ON
MINIA-
TURES, &c.

It now remains to notice the cartoons for stained glass, of which there are but few examples, and those but of slight importance.

Cartoons
from stained
glass.

Two fatal errors seem to possess modern designers in this material. Either they make servile, unfeeling copies of old work, failing to see or obtain its true spirit and beauty, but taking care to preserve, and even to caricature, all crudities of design and errors of drawing, the result solely of imperfect knowledge on the part of our great ancestors; or they follow the modern German heresy of making finished pictures on glass, which, when placed in window tracery, have all the bad quality and effect of transparencies. This last-named error is infinitely worse than the other. Rather, by far, let us have hideous-looking saints and martyrs, contorted in a way agonising to behold, attended by zoological specimens of terrifying aspect, than those polished specimens of inanity which are the natural result of poverty of design and an entire want of appreciation of the treatment which the material requires.

Amongst all the art-revivals, none in our time has been more remarkable or complete than that of Gothic architecture, the result of earnest and assiduous devotion to the old types and examples on the part of many able architects, who seem to have imbibed the true spirit and genius of their great predecessors in the art.* How comes it to pass, then, that one of the most striking features of old Gothic work—painting on glass—has met with so little real attention, if we are to judge from the results. The leading principles of the old glass-painters, which seem as apparent

True treat-
ment of
glass paint-
ing.

* It is impossible, however, to give unqualified praise to the results of this revival. To erect buildings for the public worship of the Church of England minutely reproduced from those designed and planned to perfection for the services of the Church of Rome is an error of the gravest kind.

MR. HORS-
LEY ON
MINIA-
TURES, &c.

in their works as the sun at noonday, are practically ignored in most modern examples. In old glass of a fine period no attempt at picture-making is ever found. It was never an object with the best glass designers to draw attention to their windows by a striking treatment of sacred subjects. This was the province of mural and other painting, and no imitation of such work in glass was ever attempted or thought of. Their office was simply to dim, not exclude, the light of day, and to do so by means of a tender or gorgeous combination (as the mood took them) of form and colour.

This colour was not obtained by a vulgar conjunction, in large masses, of the primary hues, but by a subtle use of secondary and tertiary ones, throwing in the primaries here and there like jewels. Another principle was to prevent any appearance of too great transparency or relief about their work. In short, to get a flatness, and what might be almost termed a semi-solidity of appearance and quality more in accordance with the surrounding work than mere transparent treatment would be. Whether they could manufacture glass as we do is a matter of no moment, as we may feel convinced that nothing could have induced them to use large pieces through which the ivy on the mullion, or distant landscape would be distinctly visible.

Those who go to Paris and desire to know what stained glass is in its highest state of perfection should visit Chartres, which is to be accomplished in a pleasant day's excursion. Those who stay at home may gaze at those old clerestory windows, patchwork though they be, at the east end of the choir of Westminster Abbey, and both at Chartres and at Westminster there is ample opportunity of comparing old work with new, and there can be few more interesting questions to solve than the cause of difference between the two. It is assuredly one of principle in design and arrangement of colour, and by no means confined to the quality of the glass. Clearness and beauty of design is apparent in all the old work. The patterns never seem inspired by the kaleidoscope. But, above all, it is evident that the old glass painters never permitted positive colour to predominate; and while they did not flinch from the use of the deepest and richest tones, their arrangement of colour was so blended as to make one harmonious design, and not a disjointed mass of incongruous combinations.

Designs for
painted
glass in the
Exhibition.

Earnestly recommending the careful consideration of this subject to those who have time to devote to it, some notice must be taken of the very few designs for stained glass now exhibited. Of these there are only two worthy of notice,

the stained glass which is placed in the Exhibition not being included in this report.

MR. HORS-
LEY ON
MINIA-
TURES, &c.
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One consists of a series of studies in oil, by Pfannenschmidt, for the windows of the Church of St. Nicolas in Berlin, the other is a large cartoon, in the Bavarian court by Nesser. If any proof were requisite of the error committed in the painting of elaborate pictures on glass, it would be afforded by those works of Pfannenschmidt. They are most carefully executed, and are academically correct, but completely devoid of the slightest spark of originality. It would be far better to hang up these works as pictures on the church walls than to turn them into vulgar-looking transparencies in glass.

The Bavarian cartoon is another manifest error in the same direction. Of grim attempts at facsimiles of old work there are no examples.

It now remains to notice the few specimens of mosaic work in the Exhibition. These are confined to examples from Russia, the Pontifical States, Venice, and some experiments recently made at the Science and Art Department at South Kensington. Mosaics.

The Russian work is a magnificent example, which merits the admiration and earnest examination of all interested in the process. The subject, a group of ecclesiastics, well designed and drawn by Professor Noff, is full of dignity and variety of character. The mosaic is executed at St. Petersburg by Michel Chmielevski. There is such an unquestionable superiority in this work over all other mosaics exhibited that one is induced to believe that, owing to the free use made in Russia at various periods down to the present time of mosaic work as decoration for churches, more of the old traditions of manufacture remains there than in other localities where the process, upon any important scale, has been in long disuse. What is especially striking in the Russian work is the powerful and excellent effect of light and shadow obtained, which, without being of an unduly picturesque character, adds greatly to the appearance of the composition.

Going from the Russian Court to that of Italy, where the mosaics by Salviati are shown, one can but be struck by the poor and meagre look of these in comparison with the Russian work. This may result to a great extent from the nature of the designs supplied; but the colour and quality of the materials and the execution of the work must have much to do with it.

The experiments made at South Kensington are highly interesting, and give much promise of future success. The

MR. HORS-
LEY ON
MINIA-
TURES, &c.

materials used in these examples call for particular notice ; for, whilst the figure of Fra Angelico, the portrait of the Marquis of Salisbury, and a mosaic from a design of the late Mr. Sykes are executed with material prepared by Minton, of a porcelain nature, that employed in the figure of Phidias is a vitreous substance made by Harland and Visser, and similar to that in general use on the continent. Minton's material is to be preferred, as there is a total absence in it of that bloom and shine which is often seen in the vitreous substance, and which has a most unpleasing effect upon shadow and deep colour. Something of this is even to be found in the Russian work.

The mosaics from the Pontifical States consist solely of those performances so well known to all tourists—worthless copies of Raphael and Guido, and still more worthless views of Rome, Tivoli, &c. The satisfaction derived from a sense of permanency must be developed to the highest degree to attract purchasers for such works as these, which form a lamentable contrast to the great mosaics of St. Peter's and the Vatican.

In thus concluding his allotted task, the writer trusts that he has not omitted to consider any point of importance connected with it ; and that he has succeeded in enunciating with clearness the principles which, in his humble opinion, should influence the various departments of artistic labour upon which he has undertaken to report.

REPORT on SCULPTURE and DIESINKING.—(Class 3).—By
RICHARD WESTMACOTT, Esq., R.A., F.R.S.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

THE object of the following paper, prepared by desire of the Lord President of the Council, is to furnish a report of the actual condition of sculpture, founded on the exhibition of works in that art contributed by the sculptors of all nations to the "Exposition Universelle," now open in Paris.

Object of
Report.
Present
condition of
sculpture.

At first sight the task would appear to be an easy one, the exercise of sculpture being confined within the simple limit of representing objects by form only; but it will be seen that a difficulty presents itself at the very outset, arising from the fact that, in some important respects, there is now no common catholic standard whereby the various modern schools can be gauged. Broadly stated, of course Nature should be this standard; but all who have studied art, and know its requirements, are sensible of the importance of considering how far, or, rather, under what aspect, Nature is to be the artist's guide—a remark that applies especially to sculpture.

Nature the
true stan-
dard.

In the history of art the function of the highest class of sculpture known to us was to interest and incite the loftier feelings of those to whom it was addressed by representing sublime and noble subjects *under the most perfect forms*. It is admitted by all competent judges that this union or combination of the most elevated motive with the most perfect physical beauty, as its exponent, has been thoroughly achieved by one people only—the Greeks; and it is on their best sculpture, in which these two elements are found combined, that all sound criticism on this art has been based. This is not to place Greek or any other art before, or in antagonism with, Nature. Art is Nature seen through the medium of mind and refined taste.

It is obvious that this canon, simple as it may seem, cannot, in this our time, be the only basis of a report of the present condition of sculpture.

No fixed
canon for
judging
modern
sculpture.

Every sculptor considers himself at liberty to exercise his own fancy, both in the character and class of his subject, and of the forms in which he presents it. Whether this freedom is an advantage or not to the practice of sculpture as a fine art, in its true sense, is not a question now to be considered. It is only referred to as a source of difficulty to a writer in offering anything like a systematic report on the actual condition and future prospects of the art.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

High stan-
dard in
ancient
schools.

It will help to explain the view here taken if it is remembered that in the best ancient schools there were certain laws to which artists were obliged to conform; and in many particulars even the "treatment" of the sculpture was confined within prescribed limits.

First, from the most Archaic period down to the perfection of the art in the fifth century (B.C.), the subjects and motive of sculpture, in all nations, were regulated by strict religious influences. The dignity of art was preserved, and no opportunity permitted for the introduction of any element of vulgarity or of commonplace. And, secondly, when at the date referred to, sculpture had reached its highest excellence, the great principle was established that the conceptions of the sculptor should, as a rule, have their outward expression in the most perfect physical forms—a noble and profoundly philosophical idea, that the good in sentiment should have its expression in the beautiful. These forms would, of course, vary according to the fitness of the particular type to express the idea or thing signified; and yet each and all might still be of the very highest beauty: Nature, in her normal and most perfect aspect, being taken as the true standard of imitation. Thus, for instance, the appropriate representation of a Mercury or a Hercules would both be sought for in the utmost perfection of the human form; while yet the forms themselves might and indeed necessarily would, exhibit a marked difference as to class and character. So in the idea intended to be conveyed in a statue of Jupiter or Apollo, of a Mars or Cupid, a Juno and a Venus, and others of an equally widely contrasted individuality, the *forms* would be perfect of their kind, although they would differ essentially in character.

Judged from so simple a point of view, ancient sculpture is therefore brought within easier conditions for estimating its merits than can be the case when the art is practised under less strict observances; and, indeed, only according to the fancy or caprice of the sculptor or of the age and people for whom he labours.

Sculpture
an art of
form.

Sculpture being essentially and wholly an art of form, the real question is, whether the forms employed are to be of a high, the highest, type of excellence; or whether, assuming, as some do, that the whole and sole function of art is imitation, these forms may be of a commonplace character, as they occur in ordinary circumstances, where the normal and original perfection of nature may have suffered deterioration from accidental causes—as labour, climate, sickness, old age, or any other disturbance to which humanity is liable.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

Class of
form.

If art is to be judged by the higher standard, it seems to follow of course that the canon should be established on some acknowledged principle. If, on the other hand, the excellence of sculpture is allowed to consist in servile imitation only, without reference to the quality or beauty of the object imitated, a much lower standard will be found sufficient for testing its merits; while a very inferior tribunal will be quite competent to measure and decide upon its place in art. It is to such a tribunal that sculpture is, in these days, usually referred, for there are but few who are truly qualified to judge this art by the higher standard.

It is sometimes asserted that that which pleases is beautiful to the person pleased, and that every one has the right to exercise his own fancy in determining what is or what is not beautiful. This is a fallacy. The abstract right to derive pleasure or gratification from any object, or it may be work of art, may be conceded; but no amount of satisfaction it may possibly afford can endow a work with beauty if it has it not. Nor is every-one capable of judging, off-hand, whether or not this quality is present. In art it is not, as many suppose, merely a question of individual feeling. Certain qualifications are required to form a sound judgment on so subtle a problem. This is especially the case in estimating what constitutes beauty in the human figure, so full of variety in all the conditions of sex, age, strength, and character. There must be, in the first place, some knowledge of the construction of the figure and of the laws of action; the power to discriminate between various classes of form; and, by practice and careful education of the eye, to know how to compare art with Nature, in her best aspects, in living models, and thus to determine what it is that artists and poets mean by Ideal Beauty. It is scarcely saying too much to assert that sculpture, especially in its highest forms, can never be popular in the ordinary sense. To be able to appreciate it, and to judge of its merit as a phase of fine art, a people must have some preparation, or education, or they must be so accustomed to see good works, which, indeed, is a form of education, as to be capable of perceiving at a glance what claim it has to notice. In England there is little or no opportunity of acquiring this qualification.

Education
in principles
necessary
for judging
sculpture.

Education in the principles of art and in æsthetics is not recognized in our schools or university system. The consequence is most injurious to real and true art, in so much that the field is left open to the very worst and lowest influences, and no surprise can be felt that, under such circumstances, incompetent judges and committees patronise unworthy practitioners, and thus have the dangerous power

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

to place before an ignorant public works that can have but one result, namely, to vitiate the public taste, and to depress the standard to the level of inferior productions. Another cause of the unpopularity of sculpture is traceable to the habit of taking its subjects from obsolete classical mythology, which very few, including, not unfrequently, the artists who adopt them, understand, and with which, of course, still fewer can sympathise.

The true artist, like the poet, *nascitur non fit*. It is the function of academies and schools to qualify the sculptor to produce works of technical excellence, but it is not pretended that a genius for art can thus be imparted. The student's powers of observation are to be awakened and exercised, and elementary education in anatomy and design is supplemented, in the case of the sculptor especially, by keeping before him, as his best guides, the most approved examples of ancient art. With this training of the eye and hand the artist of even ordinary capacity will almost mechanically reproduce very creditable statues and *rilievi* of the true classical pattern. If, also, he is endowed with the inventive faculty, and has a true appreciation of beautiful form, his works will command a higher measure of praise for the taste and feeling they exhibit; but the bias of his early teaching will be seen, and his productions will be judged and tested, not so much on their own merits as by the degree of resemblance they show to their prototypes of a by-gone age. It will be seen in the course of this review how necessary it is constantly to bear this in remembrance. Many sculptors of the present time are deservedly eminent for their ability in producing works of this class. Of those which religiously adhere to the ancient modes, many might with justice be preferred, for technical qualities, to the majority of ancient remains which crowd museums and collections of sculpture. In knowledge of form, in execution, and in every particular in which the mere material and technical excellence of Greek sculpture can be reproduced, modern artists have given sufficient proof of their power to compete, in these respects at least, with some of the greatest masters of the art whose works they imitate. But, after all, their merit consists chiefly in their successful following of the ancient standard, and, consequently, the works of the most accomplished sculptors of this school, of whatever nation, exhibit so close a resemblance that it is almost impossible to distinguish in them anything like a national idiosyncrasy. It is only when they betray some slight peculiarity of treatment or execution, not easily perceived by unpractised observers, that they can be taken out of the

Technical
excellence of
modern
sculpture.

ordinary imitation or pseudo-classical category; and then, in the degree in which they depart from this canon, they lose their claim to belong to the highest school of beauty.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

With reference to this very subject of examples, there can be no doubt that the traditional excellence of the Greeks in sculpture is very inadequately represented in the large collections of works that have reached modern times. The museums of Europe possess, with very few exceptions, but repetitions and often indifferent Roman copies of the more celebrated productions of the great masters of Athens, Sicyon, and Argos. It is true, the *motive* and general spirit of the ancient feeling and intention, so remarkable in the simplicity and repose of the compositions, may be traced in the numerous statues and *rilievi* that abound, but however valuable they may be in the estimation of antiquaries and scholars, usually very incompetent judges of technical excellence in art, and however useful in illustrating the history, the customs, myths, and poetry of their age, how limited is the number of those which, if judged by competent, practical opinions, can be classed as examples of perfect sculpture. It is, indeed, remarkable how very few of the monuments that have been preserved can be identified with works particularised by ancient authors. The names and titles which have been given to many well-known statues—as the Fighting and Dying Gladiators, the Townley Venus, the Theseus (British Museum), the so-called Jason, and others—are but conjectural, and are open to question. In like manner, the subjects of some of the most extensive compositions—the groups in the pediment of the Parthenon and of the Temple of Jupiter Panhellenius (*Ægina*), for instance,—are still matters for antiquarian inquiry and discussion.

Original
Greek
sculpture.

Subjects
very imper-
fectly un-
derstood.

It must be remembered that we are indebted for nearly all the information we possess on these subjects to writers who lived long after the most flourishing period of Greek sculpture; their accounts must, therefore, be received with due allowance for their incompleteness and imperfections. Amongst those especially noted for their records of art are those diligent but somewhat indiscriminating collectors of the gossip of their time, Pliny and Pausanias. In the curious compilation of the former, extending to almost every class and variety of subject, the account of celebrated works of art and their authors seldom extends beyond a mere catalogue of names, without detailed description, and is never heightened by any useful criticism; a circumstance the more to be regretted because Pliny distinctly refers to the interesting fact of many ancient artists having written on their art, but from whose works he gives no extracts. In Pausanias there is

Ancient
writers on
art. Their
later date
and imper-
fect know-
ledge,

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

more particular description of the works he saw in his travels, but even here there is no attempt at criticism. Happily some rare specimens are extant to prove that the tradition of the superlative merits of the great Athenian and other schools has a true foundation, and is not a mere superstition. So long as the sculptures of the Parthenon, with its grand pedimental statues and groups, the vigorous compositions of the Metopes, and the frieze of the Cella, exhibiting the busy scene of the Panathenaic procession; so long as the Venus of Milo, that noble personification of the highest class of mature female beauty; so long as the bronzes of Siris, the medallions of Syracuse, and a few other undisputed and unrivalled monuments of these schools are preserved, there will be sufficient evidence of what the great masters of that glorious age of sculpture could and did achieve. But such works as these are exceptional in their supreme excellence, and it is no disparagement to the ancients and no undeserved compliment to the more eminent modern sculptors to assert that, where they have studiously imitated the classical types, their productions will bear favourable comparison, in technical qualities, with the average ancient statues that are now found crowded together in collections of such objects. It is in the *motive* and sentiment that the modern works are deficient, necessarily; and it can only be for their material qualities that productions bearing the nomenclature of the classical poetry, but without its spirit, can deserve the commendation claimed for them.

Difficulties
in the way
of success
in modern
sculpture.

Sculpture in modern times has to contend with a real and, it may be said, an insuperable difficulty unknown to the ancients. Setting aside the question of the nude, which need not now be discussed, the most perfect forms with which the sculptors of Greece could invest their conceptions were, with them, the true and appropriate expression of an *idea*. The manner or mode of treatment of each statue or group was the recognized embodiment of thought. In the best modern imitation or pseudo-classical sculpture a statue of the noblest class of form is but an image; it is without the power of exciting, as Greek sculpture did, religious, or heroic, or poetical associations, and it is presented in a form opposed to modern habits of thought and sight. It becomes then simply a work to please the eye; but requiring for its due appreciation not only a cultivated taste, but considerable critical knowledge, qualifications in which the multitude, and, indeed, a large class above the multitude, is utterly deficient.

No doubt, as the poet says,

“A thing of beauty is a joy for ever;”

but a work of sculpture can seldom truly afford that satisfaction till it has been studied and is understood. Few are able to comprehend and appreciate its full charm; and, moreover, the greater the perfection of the work, the more study it requires to become acquainted with its best qualities. It is in this respect that there is a species of antagonism between the ancient and modern practice, greatly prejudicial to the latter. Subjects admitting of, and indeed requiring, for æsthetic objects, the utmost beauty of form in their representation, in order to bring them into the category of fine sculpture, are not intelligible to the general community; while those with which the public can sympathize must, to make them harmonize with the age and habits of a people, usually be presented under conditions more or less unfavourable to their classification with the highest examples. It is useless to attempt seriously to interest people, or to awaken their sympathies, if they cannot understand the language in which they are addressed. The Greek of the best period of sculpture—for it is wholesome and instructive continually to recur to the highest authority—was, in certain respects, sufficiently educated to judge whether the works placed before him were true to nature. In the finely-developed forms he was accustomed to see in the public games and exercises he had the ready means of making this comparison; and in the beauty and fitness of these forms he had also a standard by which to test the quality of the sculptor's art. The action was reciprocal, and the sculptor felt that he must work up to the requirements of a public in a high degree competent to pronounce upon the merit of his production. In these days there is no such tribunal; and this will account for much that seems anomalous in the present condition of sculpture. It will explain, in some degree, the contradictions, the strange irregularities, and the vicious manifestations that too often obtain public approval even in the presence of productions that might be supposed sufficient to correct and guide public taste, were the people taught how to discriminate between the good and the beautiful on one side, and the vulgar and the pretentious on the other.

The above remarks are necessary towards the true and correct appreciation of the various forms taken by modern sculpture. The great security for a high standard of the art being broken through when the two conditions by which Greek sculpture attained its crowning glory were invaded—namely, “that the motive should be noble and the forms “ of the utmost beauty”—opportunity was given for the introduction of any novelty or caprice of designs that was

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

Ideal
beauty.

calculated to attract notice and gain popular favour. All the changes thus made were necessarily in a descending scale from the established canon of excellence, and the consequence has been to lower the character of the art.

As these observations point to the great difference or divergence of practice in the principles applied to sculpture, it may be desirable to define, in a general way, what is intended by the terms ideal and naturalistic or realistic, as applied to schools of art. Ideal beauty does not mean, as some seem strangely to suppose, an original or newly-imagined or invented type, the brilliant and original offspring of the gifted artist's mind, and "evolved out of his inner consciousness." Human intelligence can only give form or expression to that of which it has, or has had, perception. It can originate nothing of the kind. Its power is not creative, but is limited, in art, to combination and the adaptation of existing elements. The result of a wholly ideal or imagined beauty, distinct from anything known in Nature, could such be conceived, would be a monster of some kind; whereas the test of ideal beauty is the truthfulness of its resemblance to Nature. Ideal beauty in imitative art simply means the highest idea or conception the human intelligence can form of natural perfection, in distinction to the appearance Nature offers in her ordinary aspect, where her normal excellence may have been impaired by accidental disturbance.

Realistic
school.

The *realistic* school, as opposed to the ideal, aims at exhibiting objects precisely as they are exhibited ordinarily—that is, without selection and without improvement. In the lowest form of this school—and it has its degrees—no imperfections are allowed to interfere with the truth of the imitation. It is enough if the object be found in Nature; and ugliness, coarseness, even decay and disease, are for this reason considered worthy of careful representation. The naturalistic and realistic schools have their source in the reaction from the tame, uncongenial repetitions of the classical antique that so long oppressed art. The principle of admitting subjects of present interest as fitting objects for its exercise, merits, therefore, full acknowledgment; but it has its dangers in practice. How far its application or exercise may be safe or permissible in the sister art of painting, which has so many and diverse means of attraction—in colour, chiaroscuro, perspective, atmosphere, and the power to represent unlimited space—it may be difficult to say; but in an art that has none of these accessories to depend upon, and whose most sure and approved instruments are simplicity, breadth of treatment,

refinement and beauty of form, it may safely be asserted that such freedom, unless most judiciously exercised and controlled, is utterly incompatible with the conditions on which it can exist, if it is to aspire to rank, even *longo intervallo*, with the noble achievements of the great masters of sculpture.

Having made these preliminary, but not irrelevant remarks on the principles which should direct the practice of sculpture, the object is now, by examining the large collection of works in the Exposition Universelle, to form a judgment on the actual state of the art; to inquire whether sculpture is in a sound condition, indicative of progress; or whether it is subject to influences that may retard its advancement. It will have to be considered chiefly under two aspects. The first, where it is practised, more or less, in conformity with the ancient and classical traditions; and next, where it is exercised on the freer principles, now so prominently put forward and so strongly advocated by the realistic school.

A very large amount of works in the first of these divisions, by sculptors of every country in which the art is practised—France, Italy, different parts of Germany, Belgium, Holland,—are found in this collection. Among these are productions which would claim especial and distinct notice for the very high qualities they possess were the object here to do honour to individual artists. But this would be to usurp, in some measure, the functions of the jurors, whose delicate and responsible office it is to pronounce upon the several works submitted to their judgment, and to select those artists who may be deemed most deserving of marked recognition.* Ours is confined to the more general question—namely, to report on the state of the art itself, and its various branches. In making this survey, the sculptors of France, from the extent as well as the merit of their contributions, are justly entitled to the first notice. Their best works exhibit many high qualities; fine, well-understood form, drapery largely and grandly composed, and great mastery of execution. The style, too, in a great proportion of their works, is broad, showing the influence of the best antique examples. But this characteristic is not universal, and in the minor details of their sculpture the national idiosyncrasy is occasionally observable in the peculiar treatment and expression of the heads, especially in the female figures. In these the French artist appears to be tempted to do—possibly with the view of asserting his independence

France.

* This report was written before the jury awards were published.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

and individuality, and, next, of addressing modern sympathies—what the Greek sculptors scarcely ever attempted, namely, to exhibit in his statues what may be termed human impressionableness. No doubt individuality is thus obtained, and the works are further removed out of the category of mere servile imitations of the antique, against which it is so necessary to protest; but where this is done, and in the degree in which it is effected, it is too frequently by the sacrifice of that calm, unimpassioned beauty which is so remarkable in the best ancient schools; and, so far, the art loses something of its dignity.

It must strike those who are conversant with the French practice how great a change has taken place in the style of their school since the influence of the pseudo-classical teaching of David and his scholars has passed away. This in itself is evidence which nothing but prejudice can resist of the progress art has made in France. The artists, both painters and sculptors, have in their best works shown the power to think for themselves; while, at the same time, they can admit and feel the use and value of the ancient traditions, and be guided by them as the surest and safest examples on the true principles of art. This is the more observable in their sculpture, because here the difficulty of emancipation from the older traditions was greater than in painting, from the fact of the existence of so many ancient monuments at hand to assert their unquestionable excellence and authority. When he can freely indulge his own feeling, the French artist shows both daring and originality. Imaginative and impulsive, he often, it is true, transgresses the rules of simplicity that are seen in the best examples. Conscious, and at the same time prodigal, of his power, he seems to take delight in displaying it, aiming at being *sensational*, both in his subjects and in his manner of presenting them. Sometimes this is shown in over-energetic action, bordering on the melodramatic; striking and effective at first sight, but unsatisfactory from the painful and exhausting impression it conveys of sustained exertion without prospect of repose. Sometimes the French artist endeavours to create sensation by an excess in the opposite direction, of extreme simplicity. This too often results in tameness, and a species of a pretty but false sentimentality, bordering on affectation; and however skilfully the technical part of the work may be conducted, and however well-studied the forms, the work fails as a true exponent of natural feeling.

It must be admitted that this indulgence of freedom and independence has its evils. Too often the eagerness to exhibit this is shown in representing subjects of very objection-

able character which seem to be only intended to appeal to the coarser class of feelings. In works of the kind alluded to the bold display of the entirely naked figure, of the female especially, with no other object apparently than its immodest exposure, shocks the feeling of every real lover of art and of the beautiful. It is not that the nude figure, purely treated, is necessarily indecent—far from it; but it is no prudery to say it may be, and in France constantly is, so suggestively presented in art as to be eminently offensive to good taste. It is no slight reproach that there are many painters and sculptors in France, artists of great ability, who seem studiously to devote their talents to providing works of this demoralising character. It is not intended, here, to disparage French art, but only to remark on its misapplication; and a report on the actual condition of sculpture would be incomplete and untruthful if a most objectionable phase of design peculiar to this school—the more dangerous from the ability shown in its treatment—were to be passed over without comment or protest.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

Tendency
towards sen-
suous art.

The Exposition contains several specimens of portrait sculpture, showing that the French sculptors are now extensively and successfully practising this branch of art. It is, indeed, a requirement of the age which sculptors are bound to meet; but it is subject to conditions so unfavourable to its exhibition as fine art (owing, first to the obligation to use the dress of the day; and, secondly, to treat the head—that is, the face, usually the only part shown uncovered—with a due attention to individuality), that it scarcely is possible to consider such works as fair illustrations of the actual state of sculpture. That sculptors themselves feel this, and that such practice is exceptional, is seen in their choice of a totally different style in all their works of preference. The equestrian and single statues—not exclusively by French artists—in this Exhibition show variously the talents of their authors in dealing with a great art-difficulty, in giving characteristic action and good expression, and in skilfully modifying the more objectionable details of modern dress. In busts allowing of a more general and conventional treatment in the drapery there are some good examples by French sculptors. Many of these works are broadly treated in style, and are full of character, without exaggeration—the fault formerly of this school. There are, indeed, some remains of this, either in the extreme action given to the *pose* of the heads or in the dashing freedom of the modelling, which may be objected to. Still, it shows power, of its kind; and it seems but an expression of that almost irrepressible energy that is so characteristic of the nation. The execution of

Portrait
sculpture.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

some of these works in marble is deserving of the highest praise. In the *rilievi* (*alto* and *basso*) exhibited in the French department there is a want of that simplicity of treatment and careful distribution of the composition and individual figures which gives character and distinction to the subjects so treated by the ancients. The temptation to be picturesque causes this deficiency in this branch of their practice; but the same facility and the same knowledge of the figure, which are so observable in the best French sculpture, are equally exhibited here, and show evidence of the sound academical teaching of their schools.

Medals and
die-sinking.

The French artists have long been eminent for their attention to and skill in medal-engraving and die-sinking. It has always been the habit of the Government of France, from a very early date, to encourage these arts; and the sculptors have worthily responded to the patronage and protection thus accorded. Some of these works in the present Exhibition are of large size, and deserve attention for the great talent they display when groups and large compositions are introduced, and for the successful treatment of portrait when individual likenesses are given, as well as for the admirable execution exhibited in the workmanship. It will be profitable if the admirer of this elegant class of art will compare the works of the present age and schools with the productions of the great medallists of the fifteenth and sixteenth centuries; especially with some of the medals of the Popes, as Sixtus IV., Julius II., Leo X., and Paul III., when such artists as Pollaiuolo, M. Angelo, Benvenuto Cellini, and Alessandro Cesati (*il Greco*) were employed in their design and execution. A great difference will be observed in the style of the works of the two periods; both have their merits and recommendations; but there are few or no instances among the examples of the older schools of the size and pretensions of such works as are now produced, especially by the French medallists.

Italy.

Next to the French rank the sculptors of Italy, in the display made in this international collection. Their contributions are very numerous, embracing a large variety of modes or styles. Sculpture does not appear to be practised by them on any fixed principle. They seem rather to lend themselves to any fashion which is likely to attract notice than to aim at establishing a character for a sound and really good style of art. When they affect the antique, they follow the form rather than the spirit of their examples; and thus there is a character of tameness and insipidity in their productions. There are a few happy exceptions to this rule; but it will be agreed that the attention is seldom arrested

by any very original treatment or feeling, and where either occurs it rather leans to the pretty than to the large and grand. A striking feature in late Italian art is the care bestowed on details. It is a branch of that naturalistic or realistic art which is of the hand rather than of the mind. It appeals especially to the uneducated classes, who, from want of direction and instruction in the real objects of art, always find something to admire and wonder at in minute copying. This is more marked when the imitation is effected in a material seemingly of such difficult manipulation as marble. Sculptors who have little or no artistic genius, but who can show a certain amount of mechanical skill, delight to exhibit their power in what is, in fact, often only a species of charlatanism. There are too many instances in this department of this tendency to give undue prominence to the carver's skill, the more to be regretted because it can boast productions of merit in much higher qualities. Much of the effect of a work which is meant forcibly to address the feelings and to awaken profound sympathy may be lost if, in the same composition, its author expends an equal amount of labour and care in the imitation of a torn garment, in the stitching and sewing of the dress, or the broken rushes of a chair. In like manner the profound associations intended to be aroused by the solemnity of a subject which addresses itself peculiarly to the sentiment may be altogether destroyed by the attraction offered by the details of the work. When the real point of interest can occupy but a small space in the composition it is always dangerous to introduce, prominently, any less important elements capable of interfering with what should wholly absorb the attention. The visitor to this department of art in the exhibition will readily understand the allusion here made to two highly meritorious works which are open to the above reflections. In referring to the busts in the Italian department, it is impossible not to be struck with the exaggerated style which characterises the majority of them, as well as with the over-attention paid to ornamental details.

The sculptors of Prussia have for a long period established their claim to take a high position in their art. There is no necessity to quote names nor to refer to works which have obtained for them this well-merited distinction. The contributions of this country and of other parts of Northern Germany to this Exhibition bear out the general commendation bestowed on them. The German artists do not, generally, follow the ancient traditions with the same persistence as some other schools. With a fine sense of the

Prussia.

Germany.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

value of good form they carry an independence of feeling into their design which preserves their art from the reproach of servility. It shows an endeavour to take what may be called a middle course between the ideal or classical and the extreme realistic. It is a means of connecting art with modern feelings and associations without necessarily vulgarizing it, as the ultra advocates for the natural style are apt to do; and where it can be done without altogether sacrificing the principle that beauty should be an element of fine art, it has the force of common sense to excuse and even to recommend it. The patriotism and love of fatherland of the Teutonic nations leads them to employ art largely in subjects of national interest; and they strongly feel the importance of representing historical events in a form consistent with the national idea. In doing this, there must always be the antagonism, to which allusion has been made, between the finest sculpture and its requirements, and art that is to be made consistent with modern associations.

There is one obvious advantage in making the examples of the best schools of art the groundwork of instruction in design, and that is the influence they exercise in various branches of industry in which good form may enter. It educates the mind and taste, and teaches the value of beauty. This is very noticeable in the instance of France, and it is gratifying in examining the various productions of other countries—at Berlin and Dresden especially—to observe the marked effect of these studies in the elegance of some of the designs and the beauty occasionally seen in details.

Holland.
Belgium.

The sculptors of Holland and of Belgium also do honour to their respective countries, and, though their contributions are not numerous, enough is done to establish their claim to take rank worthily with the most successful practitioners of the art. It is creditable to the artists of the Pays-Bas that with so few works they have been able to secure the favourable attention of many good judges of art. Besides the statues which Belgium exhibits, there are some excellent examples of their skill in medal-engraving, showing that sculpture in all its branches is being carefully and successfully studied amongst that intelligent and enterprising people.

Familiar or
"genre"
sculpture.

An exception to our rule, not to notice particular works, may be allowed in the case of some small terra-cotta models in the Belgian department, which cannot properly be classed with ordinary sculpture. They belong to the familiar picture-sculpture school, and represent scenes from domestic life, and from Shakespeare and Molière. Their merit—and it is great of its small kind—consists in their broad humour

and true expression, to which may be added great care and ability shown in the modelling. It is, however, an application of sculpture rather to be deprecated; for it offends against the conditions of real fine art, which require that the subject should be elevated in sentiment, and be expressed in the most perfect and, as far as possible, the most beautiful forms.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

In this department, as well as in the other German collections, are some examples of works in *rilievo*, to which attention may be directed. Some of these exhibit considerable merit of various kinds, in simplicity of style and good form; but the greater number are composed on the principle of pictures, with too much crowding of figures, and a consequent want of distinctness in the groups. The true value of preserving the planes of the respective parts is too often lost sight of, and foreground figures and groups are thus made to throw their own forms, and in particular lights, their shadows across, and falsely, on what are intended for distant objects.

The great sculptors of antiquity always treated what is called the "ground" of a relief simply as a flat *plane*, against or on which the subject was to be represented—not as a perspective background connected with, or as forming a part of, the design. The best examples of the principle are seen in the *rilievi* of the Parthenon, where, as a rule the groups and figures are presented as on one plane, and where there is no attempt at foreshortening or perspective. An art of form in which the introduction of *aerial* tints is impossible cannot legitimately exhibit objects in linear perspective only. All attempts to do this successfully have failed, even in the hands of sculptors so able, in other respects, as Lorenzo Ghiberti, M. Angelo, Bernini, and others.

Treatment
of (basso)
relief.

It would be agreeable if the limits which must be observed in this report would admit of more particular reference to some worthy productions in all the departments that have come under review. But the indulgence in praise must occasionally have had its counterpart in less complimentary remarks wherever our examination has extended. It would then be necessary as well as just to give reasons for both, and to describe carefully each work so criticised. To do this adequately would require a paper of greater pretension and size than the present summary, in which the object has been simply to note the actual condition of sculpture as a whole. This also suggests a reason beyond that before referred to, that of not interfering with the duties of the jurors, for not dwelling on the works of individual sculptors.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

Large
amount of
common-
place sculp-
ture.

The exceptional merit of one or two artists in any department of art does not afford ground for declaring that art generally is in a satisfactory condition in the country where this occurs. The verdict must be given on the larger view that must be taken of the entire range of art; and the impression its practice, in its various ramifications, makes on the observer, and the extended influence it is capable of exercising.

When sculpture is practised so widely, almost universally, as it is in the present day, and with so many various objects, there will naturally be a great difference in the kind and quality of the works produced. The art may be followed by the artist of real genius from a love of the beautiful, and to give play and expression to his fancy and imagination. Or it may be taken up simply as a trade or calling, when mechanical skill may be exhibited solely for profit, and when there is no exercise of the inventive faculty, nor of any true artistic sentiment. Sculpture of this kind abounds; and, as little or no effort of the mind is required in its production, the class of artists who practise this sort of art are capable of supplying any amount of works, of all classes and schools, not only with facility but with very fair average success—if only the material or technical quality of the art be considered. Every country can show its crowd of statues and groups in this large field of commonplace; for up to this point sculpture is an art of easy acquirement. It cannot, however, class much higher than figure making, such as clever carvers and modellers may be easily taught to produce.

Austria,
Bavaria, &c.

There is no intention to throw a slight upon other countries than those particularly noticed, by omitting to review their contributions in this report. But the works exhibited by the sculptors of Austria, Bavaria, and other nations which might be named, do not display any peculiar characteristics which demand separate consideration. Usually the better class of statues merely show, more or less, the influence of the academical study of the antique. To select a few of these would scarcely advance the object for which this report is designed. In some of the productions of the sculptors there is no attempt at showing the influence of the higher schools of form. The art is simply employed as a means of ingeniously representing very common subjects, and has only a confined, local value for clever carving, or some similar recommendation. It may, however, be observed here that some of the best known sculptors are absent from the Exposition, so that the field for forming a judgment on the state of the art is to some extent limited by that circumstance.

It is mortifying that Great Britain is not represented in this Exposition Universelle of sculpture. There are some works by British artists, but they are few in number, and scarcely of a character to afford an adequate view of the state of the art in this country, or of the ability of its best sculptors. Several of the artists who declined to contribute to the Exhibition stated, in a memorial addressed to the Imperial Commission, the causes that led them to this determination. It is not necessary here to enter into the particulars of this explanation; nor is it desirable to give greater prominence to the absence of English sculptors from this Exhibition by enlarging on the grounds of their excusing themselves from taking part in it. It is to be regretted that, when it was found that British art in this department could not be represented in a way that would do credit to the nation, any specimens at all were allowed to appear as a contribution from England.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

Great
Britain.

To conclude. The impression left by a careful examination of the works in sculpture of different nations is, on the whole, of a favourable character. That there is much that challenges criticism must be admitted; but the general practice of the art affords satisfactory evidence that, while its employment is very greatly extended, there is also manifest improvement in sculptors, in knowledge of form, and in a feeling for the beautiful; showing the value of close observation of Nature, regulated by the discipline derived from a careful study of the best ancient examples. There is also considerable technical power shown in execution—in carving, modelling, casting, and chasing—proving beyond question that in the material exercise of the art there is good ground for congratulation.

Viewed
materially
and techni-
cally, the
present
condition
sculpture
satisfactory.

With respect to the more interesting subject of inquiry—namely, the influence of art on public taste, and as a means of improving the feeling for what is refined in form in the masses, the benefit is not equally diffused; and it is obvious it must vary according to circumstances. It certainly seems to have this good effect in France. It is true, the artists there do not always exhibit the best taste in their own productions, nor do they always show the influence of those purer examples which are the best guides; but the mere fact of the extensive employment of sculpture wherever it can be introduced proves that it is almost a requirement in France; and it is inconceivable that an observant and acute population that has constantly before it works of art should not be improved by such association. It will be observed, also, that, though French sculptors exercise their fancy and their skill in every style that is known, the rule of the artists is

Influence of
art on pub-
lic taste.

to some
of the
French
sculptors
is to
reproduce
the
ancient
style

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

to endeavour to gain distinction in the higher departments of the art, and, in all public works especially, to treat their subjects, as far as possible, in accordance with the best traditions. The peculiar taste of the nation, seen in many of the productions of the artists, takes something from the value of works which strongly exhibit such individuality; but this does not affect the general assertion, that the aim of the best French sculptors is to produce works in which a large style of treatment and good form may prevail. It is abundantly proved in this Exhibition that the French can produce works of the realistic type, high and low, quite on a par with those of any other nation; but it is exceptional, and the lower style has here, as such art had with the Greeks, a contemptuous nickname to distinguish it. The habit of preferring the best class of forms, and of exhibiting the most careful attention in matters of execution, is almost unlimited in its operation, and deserves special notice. In architectural decoration; in the enrichment of furniture, as in lamps, sideboards, cabinets, canopies, and panelling; in statues and *rilievi*, applied to clock-stands and reading-desks; and in the design and execution of gold, silver, and other metal work, the merit of the French artist is universally recognized. This may be classed as an inferior application of art; but it will be admitted that one of its most important functions is to elevate and refine the public taste; and it would be vain to deny that it has this effect in France in all the numerous branches of industry wherein art can enter. No greater homage can be paid to a nation than the attention that is universally bestowed on the taste so frequently exhibited in design by the French. This praise takes nothing from others who may also have just claims to recognition; but, looking at it in a material point of view, it is the specialty of this ingenious people.

Causes of
superiority
of the
French
in many
branches of
art.

The influence exercised on art by the French school justifies an inquiry into the probable causes of the high position it occupies. First, whether it is owing to their system of art-education, or whether it is to be traced to a natural genius for art in the nation, which carefully encouraged, has led to their eminence. Whatever value may be given to the latter suggestion, and it has no slight bearing on the question, there can be no doubt that the training of the French student in the knowledge of the human figure, and his constant practice in drawing and modelling from nature, and the best ancient examples, tend to give that readiness and power of hand that are so strikingly exhibited in the designs of their artists. The leading idea, and its value is proved by the results, among French painters and sculptors is,

that a thorough knowledge of form, and a facility in representing it, are the only true foundation for success. Their system of instruction, public and private, is based upon this principle. Many have thought that too much importance has been given to this rule, especially in sacrificing the study of colour to the acquirement of drawing; but the present condition of the French school of painting, compared with others, will scarcely warrant this conclusion. There can be no doubt, however, that the careful training in form of the French student has operated most advantageously in the sister art of sculpture. Another cause of distinction among French artists may be the habit of the most eminent painters and sculptors to take pupils. Besides the instruction they gain by precept and example, the *esprit de corps* thus engendered, and the ambition felt, both by master and scholar, to uphold the honour of the *studio* have an encouraging effect on the pupils' exertions. The objection that has been urged against a system that may lead to too great a subserviency to rules, and to the suppression of originality of thought and invention, is worthy of notice; but it cannot be denied that this usage has had its advantages here. There is no proof of the greater success of any school where this practice is untried; while many of the most distinguished artists of France have maintained that they have owed their later eminence to such association in their earlier years.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

The very general employment of art, and especially the honour paid to it in France, will also account largely for the successful practice of sculpture in that country. All subjects of national interest claim at once the attention and the service of the artists; and the Government constantly gives commissions for pictures and statues that represent any new phase of glory the nation—vain and demonstrative beyond any other people—may have achieved. Everything is made to contribute to this love of display and to this "*laudis immensa cupido*." The artists receive those honours in titles, decorations, and similar distinctions which Frenchmen so much covet; while they have also the best substantial encouragement that can be given to ensure devotion to their profession and to lead to their doing credit to themselves and their country. Thus, among the means adopted to aid rising talent, pictures and statues that have gained prizes in the public competitions in the schools of art are occasionally purchased by Government authority. These are either preserved in the Imperial or municipal collections or are presented to public edifices, as churches, *hôtels de ville*, squares, and halls, in the provinces; and their authors naturally and justly feel distinguished by this

Advantage
of Govern-
ment pa-
tronage as
exercised in
France.

MR. WEST-
MACOTT ON
SCULPTURE
AND DIE-
SINKING.

public notice. Some of the most celebrated French artists have been indebted to this encouragement and stimulus for their later successes. In short, the Government recognizes in art one of the instruments and elements of a country's greatness, and considers it part of its duty to watch over its interests. The care of the Fine Arts is a Ministerial department, called "La Ministère de la Maison de l'Empereur et des Beaux Arts." It is now presided over by a Marshal of France; but its "Surintendant" is a distinguished artist, who has the supervision of the public galleries, including also the charge of the collections of antiquities. A point of importance, and worthy to be noticed here, is the opportunity that exists in France of procuring a tribunal of judges competent, from their practical knowledge of art, to pronounce upon questions of interest to artists. The respect and confidence of the profession and of the public are thus secured, and a real value is given to their decisions.

Competition
and quali-
fied judges.

Recognized and encouraged in so many different ways, it cannot be a matter of surprise that the fine arts in France hold a higher position than they can do under the conditions in which they exist in less fortunate and less favoured localities. Without unduly elevating French art, the influence of such support is seen both in the astonishing quantity, and, taking their best works, the good quality of their productions. "*Honos alit artes, omnes incenduntur ad studia gloriâ*," says Cicero; and to a people so eager for distinction, and with so large a share of artistic genius, as the French, the impulse thus given is in the highest degree valuable; and, as is shown in their practice, conducive to great results.

REPORT ON ARCHITECTURAL DESIGNS AND MODELS.—
(Class 4.)—By PROFESSOR DONALDSON.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

DESIGNS.

IN the review to be submitted of the architectural drawings of the great International French Exhibition, it is of course impossible to notice all the works exhibited. The remarks must necessarily be limited to those, which may serve as types of the state of the architectural taste of the several peoples. Some of considerable merit may be omitted or only generally alluded to. But susceptibilities must not be wounded, nor the position occupied by great names in the public estimation be interfered with. It is a mere general sketch of the subject, which may give an impartial idea of this important branch of the fine arts in Europe and other parts of the globe, as presented in the objects exposed in this magnificent collection of the natural products and intellectual creations of the whole world.

It is a remarkable circumstance that, in France and most of the Continental schools except the Austrian, Gothic architecture seems to be ignored for modern buildings, unless for some churches. And (with the same reservation of Austria) the principles of that style are not thoroughly understood, and, consequently, the treatment of the parts evidences an absence of knowledge of the principles, which directed the mediæval artist. Very frequently, in Northern Germany and in France, there is in the *modern* architecture a vagueness of idea and an attempt to produce novelty; but then, in the former, it is in the adoption of the Lombard or Byzantine as a basis: In France, the classic leading features, as cornices, strings, and dressings, are pared down, and there is introduced a profusion of florid decoration, and a coquetting with the past times of the country, still with gracefulness of composition. In England Gothic architecture has assumed, under clerical influences, possession of the churches and of the ecclesiastical buildings connected therewith, such as the parsonage house and the schools; and in provincial towns, from a certain reverence for tradition, frequently with the townhalls. But there is with us another class of pretentious art—if art it may be called—a wild ideality

Modern
Continental
architecture.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

of Italian Gothic and assumption of mediæval sentiment, grotesquely exaggerated. Heavy masses and vegetable carvings, not idealised in treatment so as to become monumental nor adapted to the material; and in some instances there is a wildness for brick, unrelieved by stone dressings, producing baldness and heaviness. The commercial architecture of Paris and London is generally Italian, modified according to the taste of the people; rarely, if ever, Gothic. Still, it will be observed that there are noble conceptions of noble-minded men in this collection, whose ideas cannot be fully appreciated by drawings alone; for it is only in the building itself, when carried out, that all the capacity of the architect for his work can be thoroughly realised. Hence the reluctance of many able men to imperil their hard-earned reputation by mere drawings, in which so much depends upon the technical skill of the draughtsman.

All these circumstances in modern architecture are evidenced in the French International Exhibition; and the result shows an unsettled state of thought and intent throughout Europe—a transition, but to what end or purpose it is impossible to say. Whole nations and states have recently had their political transitions, and apparently must continue to have them. These may be ruled and decided by some determined self-will and resolute mind of a sovereign or his minister. But there is no such dominant physical power to direct the intellect of art; and unfortunately, under capricious influences, the pure seems to yield to the fantastic; and the sound, well-informed, and well-directed frame of mind is thrown upon the wild waves of the rage for novelty.

FRANCE.

Classifica-
tion of
French
drawings.

The Exhibition of French drawings admits of three separate and distinct classes of subjects, unlike any other school, and may be divided into three sections.

1st. Representing the restoration of the classic monuments of antiquity.

2nd. The illustrations of the *status quo* of the mediæval antiquities of France.

3rd. The projects and buildings erected by living architects.

This is a remarkable classification, the first section of which is due to the impulse given by the Government in the control of the studies of young architects. The results

of this course are the property of the academy, and are shown in the first class into which the drawings have been divided as above. We here see a noble series of well-studied and beautifully-drawn illustrations of the ruins at Rome, Tivoli, Pompeii, Ancyra, Verona, Heliopolis (Baalbec), Attica, as Athens and Sunium, by MM. Ancelet, Baudry, Boitte, Bonnet, Daumet, Guillaume, Joyau, Louvet, Thierry, and Vaudremer, who must be congratulated upon the remarkable success of their labours, evidenced in a series of restorations unequalled for precision, accuracy, and learned development of subject and for knowledge of the matter in hand. They are displayed in the finest possible drawings, which reveal all the majesty and beauties of some of the most important monuments of Classic Antiquity.

The importance of such studies has been impressively enforced by M. Garnier, architect of the new opera house, in his critical observations upon this department of the French Exhibition, both as to its moral and artistic influences upon the character and talent of the young architect. "Here," says he, "there is no question of a subject lightly chosen and as inconsiderately followed up. On the contrary, the artist has to undergo many months of solitary occupation in a foreign country, sometimes of exile in the very midst of the ruins themselves (as at Baalbec), and afterwards he must devote at least a year to the completion of his work, and many have even given two years in order to fulfil loyally his engagement to the academy. Yet with what joyous ardor do the young men undertake and undergo the labours, the researches, the fevered days and nights in exploring the scattered remains, the existing facts, and seeking to reveal the hidden secrets of their subjects? Does not all this trouble to compare the past and the present contribute to history and to the heart-beating life of the arts? Is it to be thought, that the time he has devoted to measure the fragments, to compare the parts, to assign to them their special position and use, has been lost to the artist? Has he not familiarised himself with the primitive principles of the ancients, both in art and construction? Has he not lived, as it were, the life of past times, and those how remote? Has he not brought together the history of man and his productions, and has he not learnt to study, to compare, to reason, so as to know what he will have to do to satisfy the wants of the present, when called upon to execute works himself, and from being a student to become a master in his turn?"

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

Such are the sentiments of one, who has passed through all these studies and emotions, and if those, who are less learned in antiquity, desire to know what was the full glory of the ancient monuments, they will in these drawings be enabled to appreciate to a great degree their arrangement and decoration, and their special adaptation to their several purposes, in all the dignity and amplitude of classic art, and for the execution and decoration of which the most distant provinces had without stint to contribute the amplest funds and their most precious productions.

The next, or second class, consisting of the illustrations of the *status quo* of the mediæval antiquities of France, has an origin totally different from that of the previous one. M. Fould, the Minister of State, decided upon taking steps to preserve the memory of the monuments scattered throughout the country, forming essential parts of its history, and which were gradually falling into decay and disappearing, either through neglect or transference to other purposes, or from want of funds to preserve them from ruin. As previously in England, a revival of taste for national antiquities arose, and those memorials of past times assumed an importance long since lost; and architects of experience, and not the students of the schools, were employed to take plans, elevations, and details of those buildings; and, further, the Government undertook the publication of a work, which should diffuse far and wide a knowledge and appreciation of mediæval antiquities. The results are exhibited in great profusion under the arcades of the central garden of the buildings; and, from their absence from the catalogue of the Exhibition, it may be presumed that they were an afterthought, as in the former Exhibitions, and to fill up vacant spaces of walling, the bareness of which seemed to accuse the fertility of French genius and enterprise. But what a glorious afterthought. It reflects the generous spirit of past ages—their fertility of imagination, their profuse generosity, that nothing vile or of low price should dishonour their reverence for sacred things—the facility of their artists and artisans to design and execute the most elaborate works and the very spirit of generous rivalry to excel each other and the works of the past time—an eager anxiety to execute whatever could be most novel, beautiful, and difficult, resulting at length in exhaustion, debility, and excess.

The epochs are divided into the Roman, Transitional, Ogival and Renaissance, and Imperial Roman: the subjects include the *Monumens anciens et historiques*, classified

under the head of *Monumens Religieux, Architecture Militaire et Civile*. The names of such men as Duban, Viollet le Duc, and Leon Vandoeyer are sufficient guarantees of the fidelity and exquisite execution of the illustrations.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

Our third class of drawing consists of the projects of living architects and of the edifices they have erected. And it cannot but be noted here and in some other of the nationalities illustrated in this Exhibition, the absence of the names of so many men, who are at the head of the profession, and who have erected most important edifices, and are now carrying out great works. It is not satisfactory that the architects of the quasi cathedral churches of St. Augustine on the Boulevard des Malesherbes, or of that of the Trinity at the end of the Rue de la Chaussée d'Antin, or the like; or of the Opera House, or of the tribunals, or numerous other monumental buildings at Paris or in Lyons, or in the other provincial towns hardly less important; or that the members generally of the French Institute should leave their genius and acquirements to be unappreciated at the Exhibition. The surface allotted for such works is most spacious, yet unfilled; while the English are crowded together in a narrow closet or distributed among the manufactures. Is there no spirit of enterprise among the French architects equal to their brilliant artistic qualities? They surely cannot be afraid of compromising their position in this friendly contest with their foreign colleagues? Whatever may be the reason of this paucity of first-rate names, we have still some remarkable works from remarkable men, which deserve our study and notice, and we shall follow the order observed in the gallery.

Mons. Chauvin (No. 849-850) has a very attractive display in the plans and sections of the "Salle des Concerts du Conservatoire Imperial de Musique." The decoration of the interior is in the Pompeian style of arabesque, exquisitely conceived and executed, elegant in form, and of the most harmonious tones of colour.

French
exhibitors.

M. Hénard (Nos. 863-5,) an artist's habitation, graceful in design and conveniently planned. In his commemoration column (No. 865) of the defence of Paris, 1814, the proportions are cumbrous, and the idea an exaggerated one; but all the details are those of a refined mind and are cleverly drawn. His decoration for an hotel at Paris is graceful and more sober than that usually adopted at present. His monument to the Alliance of All Nations, suggested by the choragic monument of Lysicrates, is finely

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

carried out, well proportioned, and with figures and fountains at the base.

H. P. Picq (No. 881) has the project for a monument at Lisbon, to the memory of the Emperor Don Pedro, a species of column like a huge candelabrum, novel in conception, but not sufficiently monumental.

In M. Questel (882-5) we recognise a master in the art : one who has for a long time distinguished himself as the enlightened teacher of the rising generation, an advocate for the pure and broad in style and execution. His Hôtel de la Préfecture de Grenoble is a fine combination, elaborately studied in plan and elevation. His plan for the lunatic asylum, just completed, near Paris, is distributed upon a principle of distinct blocks, as for hospitals for general diseases, the patients looking out into courts without any view of the country scenery, which with us is considered essential in order to lessen the idea of confinement ; and it seems surprising, that it should not have been removed into the country at some distance from Paris. His library at Grenoble contains galleries for pictures and sculpture, a museum, and library : a noble class of building to be found in most of the principal towns of France, provided by the municipality, and not left to the casual liberality of the wealthy, or the patriotic feeling of a few generous individuals. In this design all the feelings of the accomplished artist are fully developed.

M. Huot (866-867) has a project for a museum and school of design for the town of Aix, in Provence, in the French classic style, clever in its arrangements and graceful in the details. His lunatic asylum for Aix is of the usual plan, with some success in the grouping of his masses. M. Pascal (878-879) presents us with able designs, as from a young man full of imagination, with elegant details, but overdone. His hospice in the mountains, like those of St. Bernard on the Simplon, is a dream largely conceived rather than practically considered ; but is still a very fine project, thoroughly studied in its proportions and decoration.

M. Normand displays all the scholarship, the taste, and experience of a refined master in the art in his series of drawings (876) of the Pompeian house erected for the Prince Napoleon. No greater praise can be ascribed to it than its conscientious adherence to the original type in every particular. Nothing can be more perfect than the mosaics, fountains, statues, and mural decorations ; and all seems to breathe the very air of antiquity, although placed within the atmosphere of the Champs Elysées. Were he

alive, Pansa might himself cross the threshold, pass by the atriensis, give his toga to a slave, enter the Tablinum, and think himself at home and with his Penates.

Following up the ideal, we shall close our review with the notice of M. Lameire's mythical decoration for the interior of a church of quasi-Byzantine character. It is a very effective composition, elaborately and profusely decorated with prophetic subjects taken from the Apocalypse, wildly conceived, exquisitely drawn, and evidencing a fine feeling for colour.

AUSTRIA.

Austria deserves especial notice for its architectural designs and drawings, and it has its notabilities in the study and illustration of antiquities and architecture, as also some important buildings carrying out. These seem to indicate a great movement in the art, although probably we have before us only a limited number of the edifices actually in the course of erection or projected. The display is not confined to works at Vienna, but reaches to distant parts of the empire, Pesth especially contributing very important examples.

Vienna presents us, in the catalogue, with the names of three men among her architectural hierarchy, to whom may be assigned an European reputation; and, taken alphabetically, they are Ferstel, Hansen, and Schmidt; and Henczlmann also gives proof of deep archæological research and careful design.

Austrian
exhibitors.

Ferstel's votive church at Vienna, which is much advanced in construction, may be cited as a happy adaptation of the elaborate Gothic of the later periods, reflecting many of the beauties of the Cathedral of St. Stephen, and of Cologne Cathedral as in the towers. Its exterior is full of sparkling effect, with all possible varieties of chiaroscuro; but it would be better if there were more repose and breadth. His Akademie der Wissenschaften in Pesth is also a very fine design; and he shows that he can handle also Italian architecture with success in his palace for the Grand Duke Ludwig Victor, in Vienna, and in a design for the Commons House in the same city; and he exhibits a castle in Bohemia and a country house, which are clever.

Professor Schmidt has an able Gothic church in der Vorstadt Weiszgärber, Vienna. There is also a novel and fine design for a polygonal Gothic church, having a central dome, well conceived and well adapted to the style. There

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

is by him also a very fine hall for the Gymnasium Academy of Vienna, with the roof framed in the character of our wooden hammer beam trusses, well proportioned in size, and appropriately coloured. The professor has a very quaint and original design for the Commons House (Herrenhaus) at Vienna, with a well conceived plan of pentagonal form, having in the centre a vast decagonal hall, which rises out of the surrounding lines of halls and official chambers, under a lofty false dome, the chamber itself having its ceiling running up only half the height. In the adoption of such an important feature it should, as in the *Thermæ* of the ancient Romans, be brought to the outside, so as to be seen in its whole size. The style is that of many of the *Rathhaus* or Townhalls of Germany and Belgium, in brick; but it is deficient in nobility of aspect in the exterior, and the style is rather domestic than monumental. Nevertheless, it is the production of a man of striking ability—of one who thinks for himself and has the capacity to realise his conceptions with power.

Hansen embodies what may be considered the pure classic style in his Commons House and *Neuzer Erbauende Abgeordnetenhaus* in Vienna; but both are too dry in treatment, and we could desire more boldness and courage. They present, however, some graceful points of sentiment and detail.

Carl Fietz has many able designs in the *cinque-cento* style also. They are beautifully drawn and would be more satisfactory, if they were less academic.

Roësner has a church of Lombard character, bearing more strongly the impress of German features, in the cathedral of *Diakovar*, in Slavonia; and it may be regarded as the patriotic adoption, successfully treated, of a fine broad style of art peculiarly their own.

Hasenauer must be noticed for his very fine design for the restoration, or rather completion of the façade of the cathedral of Florence, the stumbling-block of so many centuries and the puzzle of so many architects, the subject of innumerable competitions, with some faint glimpse of a prospect of termination, if the spirit of the times be not counteracted by party jealousies. It carries out the style of the old cathedral and of the adjoining tower of Giotto. It combines much of the spirited outline of the *Sienna* and *Orvietto* cathedrals, picturesque and characteristic. The whole subject is, of course, a conventionalism. Hasenauer's projects for edifices are varied in character, effectively conceived, and principally in the Renaissance style.

Austria exhibits some fine drawings of Gothic buildings by draughtsmen of the very highest merit. Luntz has a bold, firm, and precise drawing of the Bridge Tower of Prague; and Banks with Willemans have illustrations of the mediæval monuments of Wiener-Neustadt, evidence of a like mastery of outline with light and shade; and there is a wonderfully bold, large, elaborate drawing of the rich altar of the village of St. Wolfgang, about seven leagues from Vienna.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

HOLLAND.

P. I. H. Cuypers, of Amsterdam, is at once an architect and a manufacturer. His designs for buildings are in the Gothic style, ill understood and defective in the details; but in his carved altars he is more successful, and executes them for a remarkably low price, producing very effective combinations adapted to the Roman Catholic service.

Dutch
exhibitors.

W. Bouwens gives the plans and other details of the hôtel of M. Pereira, executed at Paris. This is French in character and arrangement, and effective in the elevation.

Johan van Solen's design for the Byzanto-Roman church, to be executed in brick and stone in Alsace, is very ably designed and pictorially decorated in the interior.

ENGLAND.

On account of the inadequate space assigned by the Imperial Commission, the English series of architectural drawings have been excluded from the grand central zone, and are set aside in lateral subordinate galleries and mixed up with art manufactures. They are exposed in divisions, which without exaggeration may be termed closets, resembling passages, from only 5 ft. to 7 ft. or 8 ft. wide. Many drawings are hung up apart from the general series to which they belong, and some of the photographs are exposed here, while there are others 40 ft. off. There is no classification of subject, being interspersed with decorative manufactures which occupy spaces, that might have been given to the designs of the architect. Foreigners are led to disregard the real merits of the English architectural drawings from the want of befitting and sufficient space for their exhibition.

Arrange-
ment of
English
dwellings

There is a great difference between the architectural illustrations of the English and foreigner. The drawings of the latter display what may be considered subjects severely treated with plans to a large size and corresponding eleva-

Photo-
graphs
of
interior
views

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

English
exhibitors.

tions and sections exhibited in spacious, well-lighted galleries. So scarce is the room allowed to our countrymen, that plans have been rejected by the committee though sent; and the series presents not so much projects as actual works pictorially treated with all the allurements of perspective and colour.

It is not intended to examine critically and individually the several drawings in this series. That will be reserved for another portion of the reports in regard to England. The Prince Albert Memorial is illustrated by the contributions of G. G. Scott, the successful competitor, and by C. Barry, Professor Donaldson, Fergusson, and Pennethorne. Ecclesiastical architecture has its representatives in Burges, G. Somers Clarke, Joseph Clarke, Keeling, Pearson, Slater, Carpenter, St. Aubyn, Street, and W. White. Country houses, by D. Brandon, Ferry, E. Godwin, Hardwick, Howell, Lamb, Masey, Norton, Pritchard, T. H. Wyatt, and M. Digby Wyatt. Municipal institutions by Broderick, the late Professor Cockerell, P. C. Hardwick, James, Horace Jones, Sorby, Trubshaw, Waterhouse, and T. H. Wyatt. Some of the large hotels recently erected are shown by E. M. Barry, Chancellor, F. P. Cockerell, Giles, Hayward. Our commercial architecture, by G. S. Clarke, Gibson, Edis. I'anson, Owen Jones, M. D. Wyatt. And to these names may be added the following as contributors of buildings, which do not admit of such general classification:—The late Captain Fowke, R.E., J. James, Professor Lewis, Synn, Ridge, Rodger Smith, Waring, and some pleasing studies by young men—as Spiers, Redgrave, Ridge, Sykes, Townroe, Verity, and Watson. These include works not only executed in the United Kingdom but in our colonies, as Bombay, Sydney, Melbourne, &c., where Parliament houses, colleges, hospitals, banks, and other large works have risen up of late years.

Photo-
graphed
illustra-
tions.

In addition to these, it is impossible to pass over the series of photographed illustrations by most of the architects in the late important competitions for the National Gallery and the Law Courts, and those exhibited by others of our able men, as Corson, Douglas, and Stephenson, Professor Kerr, Leifer, Penrose, Pritchard, Robins, Tasker, and many views of large edifices in the section of New South Wales.

This collection exhibits more completely than that of any other country, as a distinct individuality, the works either recently executed or in progress in the British empire; and it proves an active movement in individual or combined

enterprise, and a very scanty attempt on the part of the Government to meet the wants of its administration, to promote the progress of art, or the embellishment of the capital or provinces by noble monuments. In an artistic point of view, this Exhibition also shows the unfettered liberty of the artist, unrestrained by any educational considerations or accepted canons of taste. Egypt, Greece, Rome, and the Middle Ages, nay, India and China, present their national types. But with us there is no recognised principle of design, no impress of a fixed national thought. The fanciful and the picturesque too often supersede the positive and serious; the object with many being not to advance and improve upon the past, but to create a new sphere of invention by a spasmodic effort for originality. It may, however, be claimed that there is a noble spirit of independence in the English architect, a daring to meet his difficulties, and often a very successful realization of fine design and elegant detail; a desire to do something noble and worthy.

ARCHITECTURAL MODELS.

Only two models of buildings are exhibited in the English section, and rarely any in the foreign. One is Mr. G. G. Scott's model for the memorial now in course of erection to the memory of the late Prince Consort; and the Kensington Hall of Arts and Sciences, both of like origin. The memorial is illustrated by a very fine drawing, by the model, and by a portion of one of the bronze gables to the full size, with its inlay of precious stones. This is a prominent object in the Exhibition, and shows how ably the architect has adapted what may be considered a subordinate object of ecclesiastical decoration, like the tabernacle of Or San Michele at Florence, to a monumental memorial of gigantic size, consisting of the choicest marbles, decked with gems and bronze and gold, and enriched by the works of the most celebrated sculptors of the day. These latter, however, are an anachronism when considered in reference to the main structure, although embodying the ideas of some of the most illustrious men of our time, as Bell, Foley, Lawlor, Marshall, McDowell, Theed, Thorneycroft, and Weeks, the series of distinguished names being closed by that of the late Baron Marochetti, to whom was delegated the portrait statue of the Prince, seated under the centre of the canopy. We have thus a parallel of the tomb of Mausolus at Halicarnassus, erected by the pious affection of his widowed Queen.

English
architectu-
ral models.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS
—

The fate of all great works of art in the fantastic imitations to which they may be subjected, and the acceptance in public opinion of this memorial, are already realized in the cotton stand of Messrs. Waters & Co. of Manchester, where the outlines and proportions of the original model of the Albert memorial are preserved and in size exceeded, and its various polychromatic decorations are imitated with great success by reels of various coloured cottons, so as to deceive many a casual observer, and make them consider it the thing itself, instead of a pretentious rival and caricature.

The design for the other model, that for the Kensington Hall of Arts and Sciences, appears to have originated with the late Captain Fowke, R.E., and has been further elaborated by Lieutenant-Colonel Scott, also of the Royal Engineers, assisted by Mr. R. Townroe as artist. The several aspects under which the design is shown, and the numerous sketches exhibited by the employés of the Kensington Museum, evince a certain vagueness still existing in the many minds engaged in carrying out the building. There are two great merits in the design—namely, its oval form, as borrowed from the amphitheatres of the ancients, and its vast size. Further remarks upon this design as a work of art would be premature.

SWITZERLAND.

Swiss
exhibitors.

The general style of Swiss buildings of the present day is usually based upon that of the French, but the architects frequently introduce German and Lombard elements of taste in their elevations and details. The celebrated Semper, formerly of Dresden, and now established as Professor of Zurich, has several designs. His project for the Fest Bau in Munich is graceful in plan and elevation, and does justice to his taste. Less successful is his project for the theatre at Rio Janeiro, the composition of which is confused; but, perhaps, he was restricted in his instructions by requirements difficult to realize. Under the teaching of a professor of his standing, power, and qualifications, it is to be hoped that the Swiss school will progress to the creation of a style for itself. In the gardens of the Great International Exhibition is the erection for the fine arts of Switzerland, which is bold in design, with a fine overhanging roof that throws a deep shadow on the front; and it is successfully coloured with a rich deep tone on the upper part, and grey below, relieved by graffito, which contrast well, and are very effective.

Gladback, of Zurich, exhibits some very complete illustrations, sweetly drawn and purely engraved, of first-class chalets. How bold, striking, and characteristic are these elegantly rude wooden constructions, originating in the wants of the country, and satisfied through the means immediately at hand. It is to be regretted that the architects of the Senate House at Berne, of the hotel there, and of the new Catholic church, as also of the various hotels and public buildings, completed or in progress, at Lucerne, Lausanne, Geneva, and of other parts on the banks of its lake have not contributed to this exhibition drawings of such important erections; they are really vast in size, able in arrangement, and containing many points of striking merit.

Stadler, of Zurich, exhibits a design for a Gothic church, with two towers at the west end, surmounted by pierced spires; and it may be observed in general that the modern ecclesiastical architecture follows with the Swiss, as with us, the mediæval type.

ITALY.

The architects of Italy are not, in the designs here exhibited, apparently animated by the same energy and brilliant qualities, as distinguish their colleagues in the other departments of the fine arts. In their best drawings they look back upon the past, and only scantily produce works now in course of erection.

Italian
exhibitors

Leopoldo Lombardi has two effective and large drawings of the Tabernacle of Orgagni, in the Church of Or San Michele, at Florence, and of the northern doorway of the Cathedral of Santa Maria del Fiore, drawn with powerful effect.

Mengani, of Milan, displays a plan of the contemplated alterations at Milan carrying out by the Milan Improvement Company, which will be a vast benefit to the city; but the elevation of his gallery Vittorio Emmanuele is too profusely ornamented.

The graceful screen enclosing the Italian Court shows that Italy has still its able and wise artists, men of capacity and imagination; for this inclosure of its courts is rich in effect, varied, and still well adapted for its purpose.

In this section there is a very exquisite work of art, which may not be noticed by the reporter on pictures, but which may claim mention here. It is an illuminated testimonial to Luigi Tatti, of Milan, architect and engineer, for his professional advice and services in effecting the junction

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.
—

of the railways between Arezzo and Foligno. It is in the character of Mediæval MSS., with arabesques in the Raphaelesque taste. In design, drawing, and expression, with most harmonious colouring, the gracefully involved foliage and figures equal, if they do not excel, any like work of the brilliant cinque-cento period.

Sgr. Charles Cappel, Turin, has a design for the elevation of Sta. Maria del Fiore at Florence, which is less successful than that of Herr Hasenauer of Austria, already noticed. It wants play of outline, less squareness of forms, and more verticality of treatment and character, and to be more like the north door of the cathedral and the adjoining tower of Giotto, which must always be considered the keys to the expression of any restoration.

Signor Giganti exhibits two architectural drawings of the chapel of the Treasury of St. Gennaro and tomb of Sgr. Giovanni Carraccioli, of Naples, drawn and treated with brilliant and vigorous effect of chiaroscuro.

PRUSSIA.

Prussian
exhibitors.

How is it that the architects of ambitious Prussia have been so little careful to vindicate the prestige of their school? Have they quailed before the idea of meeting the able draughtsmen of the French capital? Why is there here an almost total absence of the names of their leading men in the art? And why are illustrations of the buildings recently executed or drawings for those contemplated so scanty? This is said in no unfriendly strain; for their men of renown deserve all honour; their Schinkel and their Stüler of the past; and one could wish to honour their able architects of the present day, and here they do not allow us hardly the opportunity to do so!

Prussian
exhibitors.

The Zion's Kirche at Berlin, by Orth, is a bold conception, with some novelty in the plan, which is that of a Greek cross. The exterior is of the Lombard character, and the interior is gracefully conceived, in taste similar to the uppermost church of St. Francesco at Assisi.

Walsenau's Hôtel de Ville at Berlin is a vast brick building, with three tiers of semicircular beaded windows, machicolated cornice, and large square tower. There is no relief of stone dressings to any part; and the whole forms a huge elephantine mass of red, imposing in effect from its scale, yet without grace and repulsive. What the Palazzo Pitti is to Florence, such is, apparently, the Hôtel de Ville to Berlin. "*Informe ingens.*"

Schmitz, of Cologne, gives the project of a Gothic church, full of right feeling, masterly drawn, and equal in design to anything recently executed in England. His twelve sheets of views of architectural monuments of the middle ages are very fine.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

NORWAY.

Norway offers no architectural drawings nor models of buildings; but exhibits two curious wooden doorways, the one from the demolished church of Saulcand, in the province of Telemark, and the other from Flall, Hallingdal, presenting a series of scrolls of interlacing foliage and animals with small heads and long bodies and tails, cut in fir, wonderfully sharp and well preserved, and identical with the like features not unfrequent in Ireland, occasionally found in England, and by many attributed to the Celtic period.

Norway.
Wooden
doorways.

RUSSIA.

Russia has few architectural illustrations, limiting herself to a plan with some charming interior views of the palace of the Countess of Chanveau, at St. Petersburg, by Bollinstedt; and to restorations in the section of the "Tour des Infants," in the Alhambra, exquisitely drawn, with a precision and feeling similar to Owen Jones's illustrations. There is exhibited a model, in plaster, of a circular Russian reliquary, the original of which is of silver gilt, from the Cathedral of the Assumption at Moscow, apparently as old as the tenth or eleventh century, but bearing the date, it is said, of 1488. If this be genuine, it is evidence either of rare success as an imitation of a very remote work, or of an extraordinary traditional preservation of sentiment in the design and execution down to a very recent period. There are also some casts of curious doors from churches with architectural details of debased Byzantine, approaching the Norman.

Russia.
Plan and
model.

BELGIUM.

Carpentier's design for the Church of St. John and St. Nicholas, at Brussels, of brick and stone, is a very pleasing and well-proportioned building, of the usual Lombard style.

Belgian
exhibitors.

Suys has several drawings. He does not do justice to himself. His project for the Temple of Renown is a national monument to the late king. The Thermal building for Spa is very simple and elegant in mass and detail, and justifies an earlier impression of his merits; but the character is perhaps too domestic for such a public building.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.

It is impossible to close our notice of the Beglian architectural productions without referring to the Wiener's series of architectural medals, which these artists continue with spirit, though not always with equal success. They are valuable accessions in illustration of the history of art.

SPAIN.

Spanish
exhibitors.

The Spanish school does not, in its architecture, take the high position achieved by its painters. But there are two designs for parochial churches, by Ortiz de Villajos and Sanchez Osorio, the former of which shows great ability. It is in plan of the usual Latin cross form. The style of the exterior may be considered as Lombard, with two western towers and a central dome, all designed with great breadth and simplicity of effect. The section is remarkable for the novelty of the treatment of the interior, both as to form and colour, adopting broadly and happily the Saracenic lines and richness of decoration with some degree of novelty.

CHILI.

Chilian
parliament
house.

Chili exhibits a bold conception for the Parliament House, by Lucien Hennault, with a good, simple plan and effective arrangement in the section.

THE GARDENS.

Buildings in
the park.

It is impossible, in this review of the architectural illustrations presented in the International Exhibition, to omit mention of some very striking erections in the gardens. The pavilion of the Emperor claims the first place; and although it must be considered as a species of advertisement for those parties who have contributed the elements of which it is composed, yet in point of design, decorative treatment, and arrangement, it must be confessed to be a very refined instance of French taste. Next to this must be mentioned the Turkish mosques, kiosks, and baths designed by Leon Purrillée, and drawn by M. Eyère. They are distinct buildings, partly composed of materials, as coloured-glass windows, encaustic tiling, as also of rugs, carpets, and fountains, brought from Turkey, and put together, with French supplementary additions, in perfect harmony of taste as to form and colour. Of the like class is the Tunisian pavilion, cleverly carried out, and interesting as showing the conformity of the present usages and distribution with those of an antique Pompeian house.

There is also a Cairo Salamlik, very complete and striking in its coloured treatment, with its occupants of various trades at work—a living illustration of one of their khans. The temple and the other erection in the character of the antique Egyptian buildings are of no value as types or models, the columns of the temple being shortened one-third of their height, and the various hieroglyphic sculptures being strangely mixed of various dynasties and epochs, and the ceilings at total variance with the antique construction.

PROF.
DONALDSON
ON ARCHI-
TECTURAL
DESIGNS
AND
MODELS.
—

The wooden chalets or houses of Switzerland, Norway, Sweden, and Russia are characteristically rendered, and consequently they are very effective, as embodying the distinct nationalities in their treatment of the wooden logs, the projecting balconies and roofs, the gracefully perforated boarding and simply carved timbers, in all which circumstances the Swiss taste distances in refinement that of the Northerners.

These Egyptian buildings are of no value as types of models, the columns of the temple being shortened one-third of their height, and the various hieroglyphic sculptures being arranged in a series of dyables and episodes, and the columns of total variety with the various columns.

The wooden chaises in the north of England, Norway, Sweden, and Russia are characteristically rendered, and consequently they are very effective, as embodying the artistic satisfaction in their treatment of the wooden logs. The projecting balconies and roofs, the gracefully perforated, and the simply carved timbers, in all which circumstances the Swiss taste shines in refinement that of the

REPORT on ENGRAVING and LITHOGRAPHY.—(Class 5.)
—By JULIAN MARSHALL, Esq.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

THE art of engraving in the present day is principally exercised for the purpose of transcribing pictures from canvas to copper, steel, wood, or stone; and so multiplying the design, which is necessarily unique and can only be possessed by one, and bringing its copy or reproduction within the means and reach of the many.

In other times, painters and designers were wont to stamp their thoughts at first hand on the plate, or at most to reproduce upon it a design, which was then thrown aside or destroyed. The copper plate was their toy or distraction in the intervals of heavier work; while it sometimes served them as a field of study for more important compositions. The sketches thus made by the great painters of the seventeenth century remain to us, a most valuable legacy, and a striking proof of their facility in recording the impressions of the moment. Many anecdotes are told which illustrate the rapidity with which many of these etchings were made. In one of them it is recounted that Rembrandt was one day dining with his friend and patron, the Burgomaster Six, when the latter had occasion to send his servant out of the room, to fetch the missing mustard-pot. Rembrandt, laughing at the proverbial slowness of Dutch servants, offered to make an entire etching on the spot before the fellow's return, which he actually accomplished. We possess the result of this extraordinary *tour de force*, in the shape of a slight etching of the view from the open window, at which the two friends were seated. The print still goes by the name of "Six's Bridge," there being a bridge over a small stream in the landscape.

The prints exhibited in the Paris Exhibition of 1867 belong for the most part to the first-named class; they are chiefly transcripts of pictures already familiar to the public. Few of them are original designs, intended for the copper alone, except in the case of the *eaux fortes*, or etchings, which form a separate class.

We shall naturally commence our notice by examining the prints belonging to the French school, as coming first in the official catalogue, and as being most important in number. In this school we are chiefly struck by the excess of finish bestowed upon the engraving, and by the thought and pains given to the more mechanical parts of the work; the effect of which is to give us the utmost perfection of soft flowing

France.
Prints.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

lines, which follow each other in unbroken regularity over the objects and forms represented, and too often to give us nothing more than this, as judged from an artistic point of view. It is an exaggeration, a working out to excess, of the beautiful style of the old French school—the style of Edelinck, of Nanteuil, of the Poillys, and Van Schuppen—without many of their beauties and merits. Force and chiaroscuro, so strong in Edelinck, are now too much forgotten and sacrificed, in exchange for more polish and finesse. Large plates are covered with minute work, very beautiful in itself, as showing the extent to which mechanical difficulties are overcome by the modern proficient in the art, but too often wholly wanting in the spirit, colour, tone, and truth, which should distinguish a fine print. The broad effects of the original picture are too often neglected, in the attempt to attain that beauty of line and smooth regularity of surface, which boast an entire freedom from all merely mechanical defects.

It needs no time or argument to show how fatal must be this negligence in the case of pictures by the best old masters, translated on modern copper; however successful may be the copies of slighter and more recent paintings, which do not always need the same breadth of tone and colour in order to be faithful transcripts.

The truth of this will strike the visitor most forcibly in comparing the attempts at copying Correggio, Raphael, Titian, and Murillo, with the prints after Meissonier and other artists of the day, many of which leave little to be desired. The careful precision of Meissonier, for example, is well imitated by Messrs. Carey and Blanchard. The former (M. Charles P. A. Carey), a pupil of Tony Johannot, exhibits an engraving of Meissonier's "L'Audience," most carefully rendered, and a clever etching of "La Lecture," by the same painter; both of which show uncommon merit. Auguste Blanchard has a print after his "Chessplayers," which is also admirable in its way. The effect of light, the expression of the faces of the players, the texture of their dress, of the table, floor, &c. are given to perfection. The engraver is not so successful with his "Jupiter and Antiope" after Correggio, the famous picture in the Louvre, although there are some merits in the print, which nearly raise it to the first rank in the gallery. It is remarkable for careful drawing, and for the happy manner in which the flesh, especially of the sleeping figure of Antiope, is rendered; and it certainly has more warmth of colouring than most of the prints around it, although in that respect it falls far short of the great original. It shows, however, great delicacy of

Carey.

handling, and the forms are well rounded and modelled. There are not many better prints after old masters in the Exhibition than this. The same engraver has a print after Frith's "Derby Day," which is a good and careful copy of a singularly popular painting. Here he has had to struggle against too great odds in the shape of a large, disjointed composition, without any apparent arrangement, wanting in colour, and in which the interest is spread over a number of separate and unconnected groups. The utmost that the engraver could accomplish would be to recall the picture to those who had ever seen and admired it; and this he has probably done. Judged by itself, the print is weak and ineffective.

Louis Pierre Henriquel Dupont, the pupil of Pierre Guérin and of Bervic, exhibits several prints which deserve special attention. His portrait of Ary Scheffer, after Benouville, is striking, though very slight. It is a half-length sketch of the artist—a fine head, whose eye seems fixed on some model which the painter is transferring to canvas. The effect is rather marred by too much detail of dress and accessories in the lower part of the subject. The picture of General Lariboissière and his son, after Gros, is well and carefully engraved, though open to some criticism of the same kind. The eye is too much caught and diverted from the principal heads by the details of the foreground, which are made too prominent. His copy of P. Delaroche's picture of Moses is already familiar to the public, and is highly finished, almost to a fault. His finest print is certainly the "Marriage of St. Catherine," after Correggio, which is really charming in many respects; it possesses a sweetness which will strike everyone at first sight. The engraving shows a wonderful perfection of drawing, combined with tenderness and beauty of execution. The flesh is well rendered, and the expression and manner of Correggio are caught to some degree. There is much softness and some colour, and the distance is given with great delicacy. A little more force and colour, with less attention to mere beauty of line,—greater boldness, at the expense even of some delicacy,—would have removed the defect of weakness and a patchy look in some parts of the plate, owing to the lights being broken up and too much scattered, and would have made it one of almost first-rate excellence. As it is, it must rank among the best in the room.

Léopold Massard has two prints of merit in the same room—the "Crowning with Thorns," after Titian's picture in the Louvre, and the "Nativity of the Virgin," after Murillo. In both there is spirit, and an attempt to give colour which is not altogether unsuccessful. The latter

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.
—
Martinet.

picture is the subject of a larger print by Achille Louis Martinet, a pupil of the distinguished engraver, Forster; this is a work which possesses some striking beauties. It is, perhaps, one of the best of the French school, giving much of the manner of Murillo as well as his colouring. The composition is well preserved, and the tone of the whole print is very pleasing. This engraver exhibits also a copy of M. Gallait's picture, "The Last Honours Paid to Counts Egmont and Horn," which is striking and faithful, but not of so high a quality as the last-named print. It is too hard and cold, the bright lights and deepest shadows being too sharply contrasted, without enough of half tints to soften the effect.

Bertinot.

Gustave Nicholas Bertinot, a pupil of M. Martinet, shows several good engravings. First stands a portrait of Van Dyck, the oval frame of which recalls the times and style of Nanteuil and his pupils, when the French school ranked very high in portrait-engraving. This is a copy of the picture by Van Dyck himself in the Louvre, and is beautifully engraved; although not coming up to the standard of excellence established by the works of the great engravers of the French school of the seventeenth century. But it is a delicate and truthful portrait of the painter, full of sweetness and grace. The portrait of Alexander VII., after Velasquez, engraved from the picture at Rome, is also very good, giving much of the painter's manner. We must also notice his "Vierge aux Donataires" after Van Dyck's picture in the Louvre; and "The Daughter of Herodias with the Head of St. John the Baptist," after Luini's picture in the same gallery. The latter print is more open to the reproach of mechanical execution than the others, though none of Bertinot's are entirely free from that bright and glittering effect which is the distinguishing feature and fault of the modern French school of engraving. In the "Vierge aux Donataires" there is great merit, especially in the treatment of the kneeling figures to the right, the "donataires" themselves, and in the heads of the Virgin and Child. The drawing of some parts is questionable, but the effect is on the whole very pleasing.

Danguin.

In Jean Baptist Danguin, of Lyons, we have another of those artists who carry the art of engraving to a perfection of finesse and delicacy, which is perhaps excessive, and therefore faulty. His portraits of Louis XVII., of Marie Antoinette, of Alfred de Musset, and of Henri I. de Bourbon, Prince de Condé, after a drawing of the sixteenth century in the collection of the Bibliothèque Impériale, are highly finished to a point which exceeds, while it reminds one of the delicate style of Van Schuppen and his cotemporaries. His

"Idylle," after M. Bouguereau, shows the defect and the failure of such a style, carried to excess, when it attempts to handle larger subjects.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

French
school of
engraving.

We have endeavoured to draw attention to the prints most deserving of notice among the examples exhibited in this school of engraving, rather dwelling on their merits than on their faults—rather trying to show in what they excel than in what they fall short of the standard of excellence—and in what they give reason for hoping some better future for this poor fallen art, than in what they drive us to despair of its ever being revived. The same faults are common to most of the engravers of this French school: they have not all the same merits. Tenderness, delicacy, and finish are more common among them than force, vigour, and colour. We shall find greater excellence in their *eaux-fortes*, the work of the free needle on the copper. We owe to the artists of France chiefly the renaissance of this charming art; and among her best painters and designers we therefore look for and find, with few exceptions, its most distinguished masters. Bracquemond, Méryon, Daubigny, Jacquemard, and others, are almost without a rival among English artists; elsewhere they have certainly none. Blanchard has one very pleasing etching, after Meissonier, already mentioned—"La Lecture," good in tone and faithful to his model, but somewhat too careful and highly finished for a first-rate etching. Some parts of it look like the work of the burin. Another engraver, Léopold Flameng, exhibits several prints, one of which is an etching of some merit—"Marino Faliero," after Eugène Delacroix. He seems to have sought to produce a Rembrandtesque tone, which is not without its effect.

Etchings.

Blanchard.

Flameng.

The eccentric Charles Méryon, an officer in the French navy, who is said to have died lately, was certainly one of the most distinguished of French etchers. He has sent four views of Paris only, all of which are admirable, especially the one which gives a peep from the windows of a gallery or triforium of Notre Dame. This is a most striking little print, full of light and air and brilliance, with the jackdaws flying in and out among the columns. It would be only too easy to dilate on its beauties, and also on those of its companions in the same frame. We only regret that this excellent artist has not sent more examples of his work, which is so good and spirited.

Méryon.

Félix Bracquemond, a painter and pupil of J. Guichard, exhibits but one etching—the portrait of Erasmus, after the painting by Holbein, in the Louvre. It is, however, a very sufficient example of his art, for there is not a finer portrait than this in the gallery. The artist has felt all the beauty

Bracque-
mond.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

of the picture before him, and has transferred, not the outline, but the very spirit of it, to the plate under his hand. The work in this etching is as delicate and harmonious, and the tone as quiet and mellow, as could be desired in a print after Holbein. We can only wish the etcher had given us also some design of his own, treated in similarly perfect fashion.

Jacque-
mard.

Jules Ferdinand Jacquemard exhibits several etchings of great merit. One of these is a subject after Van der Meer, of Delft — “A Soldier and Laughing Girl” — which is capitally rendered, an effect of sunlight shining through an open window on the pair, who are seated at a table, the soldier in shadow, with his back to us. There is a little crudeness in the effect of light; and the girl’s figure appears too small in comparison with the soldier, from whom she is only 2 ft. or 3 ft. distant, owing to a want of aerial perspective. The other prints by this artist are all representations of cups, and vases, and mirrors, of bronze, crystal, or repoussé work, which it is difficult to praise too much. We must point out, especially, a cup of *cristal de roche* (956), which is as transparent as the object represented; and a drageoir of jasper and a cup of lapis lazuli, which are equally admirable. He sends also etchings of the three vases of Suger, Abbot of Saint Denis, twelfth-century work — all wonderfully delicate and beautiful in execution. We can only repeat the same praise for his pistol of chased iron and ivory, his tripod of bronze and jasper, and his mirror of repoussé iron. They are all excellent as representations of various texture and workmanship. The similar etchings (966), by Edouard Lièvre, are also of considerable merit; but are of a more mechanical kind. He gives us pistols, and vases, and the christening bowl of Saint Louis, preserved in the Louvre, and other objects etched for his work on the “Collections Célèbres d’Œuvres d’Art” with great spirit and a fine point.

Lièvre.

Daubigny.

Charles François Daubigny, the pupil of his father and of P. Delaroche, and perhaps the first landscape-painter of France, has sent several etchings, many of which deserve the highest praise. The most important of these is his “Buisson,” after Ruysdael (924), a print of charming tone and colour. The middle of the subject is taken up by a mass of wild and stunted trees, to the left are a few houses, and a man, with some dogs, is following a road on the right. There is a power and colouring in this etching that recalls the works of our own Woollett, while it preserves completely the spirit of an original work. He exhibits also a frame (923), containing eight landscapes from nature; and another large print, “Le Gué,” published by the Société des Aquafortistes, which are all extremely good. The latter is a study of cattle entering

a stream, followed by their cowherd. It breathes an air of quiet repose and evening stillness, which reminds one of the similar scenes so often painted and etched by Claude de Lorraine. These etchings just numerated are worthy of the hand of M. Daubigny, and will certainly not escape the notice of English admirers of landscape.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

Charles Emile Jacque sends fifteen etchings (954) of sheep and other rural subjects, which are very clever. Three rats, caught by their heads in a trap, are the subject of one of the best of these, in which the contortions of their little furry bodies in the death-struggle indicate a moral which is more clearly enforced in the verses below:—

“Ce spectacle effrayant doit apprendre aux gloutons,
A mettre en leurs plaisirs un peu plus de prudence,
A table comme au lit, au lit comme à la danse,
S'ils redoutent le sort de ces pauvres ratons.”

Another of these little prints, all of which are full of the life and air of the country, reminds one of some charming etching by Berghem or Paul Potter. A cow is seen raising its nose lazily to the horizon; a girl is leaning on a stick, near to another girl, who is lying on the grass and feeding some young birds in a nest, while a few more cows are browsing quietly a little further off. Such are the simple objects which are combined to form one of these pretty little prints; but there is an atmosphere of quiet, sunny, country life about the scene which is difficult to define and analyse, but which gives an indescribable charm to the etching. In another of these a girl is sitting and conversing with a young shepherd on a bank in a woodland, surrounded by his flock, who are quietly cropping the grass at their feet. His dog stands sentinel, as if to warn them of the approach of any intruder. Everything is still, and bright, and happy round the pair, who seem to notice nothing beyond each other. It is an ordinary scene, made up of common materials, and the poetry of it is homely and the theme trite enough; but it glows with a warmth and feeling which the artist has contrived to breathe into it, and which we cannot analyse.

A long and rambling kind of cottage, with farm buildings; a forge with horses, which are being shod by the village smith; a flock of sheep being driven to the meadows, such are others of the subjects treated by M. Jacque, and all with the same felicity. His works are on a small scale, and may appear slight to a careless visitor, or, perhaps more probably, may entirely escape attention; but they are full of poetry and talent, and we should be in fault if we did not point them out among the best etchings.

Maxime Lalanne sends two frames, one of which contains

Lalanne.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

eighteen etchings of landscapes, evidently from nature. The other contains a large and more important work—a view taken from the Pont St. Michel, published by the Société des Aquafortistes. This is of very high quality, as well as the smaller etchings; and they all show a great familiarity with the etching-needle and a mastery of the art. Many of the small views (959) are very charming, and the treatment of the houses, churches, &c. in the river-view (960) is most picturesque.

Veyrassat.

Jules Jacques Veyrassat sends three etchings, all after paintings by M. Bida (1019). The weakest of the three is "The Daughter of Herodias," but for this the original must partly bear the blame. The "Jew Praying" is remarkable for its careful and delicate execution and the great effect of chiaroscuro; a stream of sunshine pours in through an open casement on the kneeling figure, lighting up the principal part of the composition, while the rest is left in deep shadow. The third subject is a St. Peter, and approaches the last in excellence.

Potémont.

Adolphe Potémont exhibits a frame of etchings, which consist of two copies of paintings exhibited in the salons of 1865 and 1866, and several views of ancient Paris. The latter are extremely clever studies of tortuous alleys and cut-throat *culs de sac*, which makes one shudder to look on, and think of the stories of midnight, or sometimes even mid-day, purse-snatching, and affrays, and murders, which belong to each of these perilous passes of the old city. One almost reads such tales on the features of the street-portraits that we see here, etched by the hand of M. Potémont.

Rochebrune.

Octave de Rochebrune gives us some large, bold etchings of architectural subjects, which we must not omit to mention. His view of Notre Dame de Paris is a wonderful print, as faithful as a photograph, and equally full of detail, while preserving the greatest boldness and force and an admirable colour. It is not treated in so picturesque a manner, however, as its companion, the "Interior of the Château de Blois;" which is a fine bold picture, though no lesse laborate and truthful in details than the view of Notre Dame. The two façades of the Château d'Ecouen are given with almost equal excellence of execution and artistic effect. It is uncommon to see large subjects of this kind so admirably treated.

Woodcuts.
Sargent.

In woodcuts the French do not exhibit many specimens. Alfred Sargent has a frame of six which are very good (1007). La Rjukandfoss, Norway, is a fine view after Gustave Doré, of a grand cascade and mountain gorge, where a river falling from pine-clad heights comes tumbling down among rocks

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

and cliffs, slippery with foam and spray; and his Old Shepherd, from a drawing of M. Pauquet after Decamps, is also very good. He shows a spring in a forest, with a drinking deer, which is full of poetry, after a drawing of M. K. Bodmer; and a windmill, after Troyon, which is charming, with a clever effect of light, against which the mill comes out dark but sharply defined. His Bas-Bréau, in the forest of Fontainebleau, from another drawing of M. K. Bodmer, shows his power of treating trees: the view is one of those lovely bits of forest scenery, which may be seen near Fontainebleau, and is very cleverly executed. M. Sargent's strong point evidently lies in his power of indicating foliage, which is particularly remarkable in the last print.

Louis Dumont is another artist who engraves Gustave Doré's designs on wood; probably they are actually drawn by the latter on the blocks, on which M. Dumont afterwards operates. He gives us four of these; two from the "Inferno" of Dante, and two from the "Sainte Bible." They all show admirable work, and a complete mastery over the difficult material on which they are cut. The trees are very well executed in the forest scene which forms one of the Bible subjects (933).

M. Charles Jules Robert exhibits three portraits (989), which possess considerable merit: they represent MM. Thiers, Jules Janin, and Emile Augier.

François Pierdon sends two woodcuts, of which "Morning" (984), after a picture of his own, is delicate and pleasing: he has succeeded very well in giving the effect of early daylight, and the composition is pretty and cheerful.

We must now leave the French school, which is certainly in many respects at the head of the art of engraving in the present day: we leave it with a full appreciation of the many strong points of excellence which it can boast, and with a regret that it does not at the same time possess some of those valuable qualities which we have named earlier in the present notice, and which, with greater purity of design, would render its works entirely worthy of the highest admiration. It only remains to describe the department of lithography, as practised by French engravers on stone, before taking leave finally of their school; but our space will not allow us to do more than enumerate a few of the best works in this style. The "Temptation of Saint Anthony" (1027), by Achille Gilbert, after M. Tassaërt, is a good specimen of the progress made by the French in this branch of art; as is also "Le Sommeil" (1024), after Dubufe, by Auguste Charles Lemoine. The latter is rather faulty in drawing in some parts, but is

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

otherwise admirable as a lithograph. We may apply even more praise to the copy of Rembrandt's "Ronde de Nuit," by M. Adolphe Mouilleron (1036), the picture at Amsterdam, which is admirably given on stone in the present instance. We must also mention the copy of M. Vetter's picture by M. Claude Thielley (1041), which is very cleverly executed; and with that we must close our notice of this kind of engraving. We can only wish that our English school would imitate and strive to surpass the French in this branch. At present we are some way behind our neighbours in lithography.

Great
Britain.

Line en-
graving.

There remain to be noticed but few works from any other country but our own; we shall therefore postpone the description of them till we have reviewed all that are exhibited by British artists, as the latter are the most important and numerous, and appear side by side with the French in the Exhibition building. We shall find very different faults, as well as virtues, in the prints to which we are now turning, from those which we have found in the works we have before examined. In pure line-engraving we have not so many ambitious examples as are shown in the French room; and in those which we have we find more attempt at conveying the idea of colour, and a greater amount of vigour than can be attributed to most of the French prints; while the latter exceed them in point of finish and delicacy, which we have seen to be the beauty and (when exaggerated) the defect of their style. The English engravers are content, generally speaking, to copy their subject-picture in the *manière noire*, which has become synonymous abroad with the expression "*manière Anglaise*;" or in the "mixed manner," which has found its place in modern art as the useful drudge, the maid of all work, whose office it is to disperse, among the unpractised purchasers of such commodities, the engraved copies of popular pictures, whose production is the result simply of commercial speculation. These prints are now easily manufactured in an incredibly short space of time, at a cost of so much per square foot; and furnish a comfortable income to the ingenious publisher, who knows exactly how to pander to popular taste and uneducated ideas of art, more often leading in a wrong direction than striving to educate and improve the taste of his customers. This is the bane and the reproach of the British school of engravers, as must always be the case in every school as often as art is pursued simply for the purpose of making money; but the fault lies chiefly with the public themselves, and with those who supply them with the apparently elaborate "engravings" in gilt frames, which

cover so many walls in the houses of well-to-do and otherwise intelligent people; and not with the artist, who may be forced, by want of bread itself, to work in this way to the order of the publisher who employs him. There appears to be no remedy for such a falling-off in a noble branch of art, except improvement in public taste—the work of time, circumstances, and the struggles of some few independent artists who may from time to time appear, and attempt to produce something better than what the market requires. Let us hope that some such change may soon arrive.

The most important among the works of the burin exhibited in the English school is the “Raising of Lazarus” (6), after Sebastiano del Piombo, engraved by Mr. George T. Doo, R.A.,—a print on which he is said to have been occupied chiefly, if not entirely, for the last fifteen years. We cannot but admire the indefatigable toil of a man, capable of earning a competence by producing ordinary works suitable to the quick demand of the market, who will devote himself in this way, and for such a length of time, to one great picture, and make it the principal object of his last and most ambitious labours. He is said to have made careful studies from nature, as well as from his original picture, for every part of this large plate; and the result bears testimony to the conscientious work bestowed upon it. The greatest care, and the most attentive and patient labour, are evident in every portion. The success of these, however, is marred by the too formal arrangement of the lines, which produces the effect which is technically known as “grinning” in some places; and by the want of distance, the flat, cold, white colouring, and the incorrect rendering of the features and expressions of many of the principal heads. These faults make the print an unsatisfactory translation of one of the finest and most glowing pictures which we possess, and cannot be overlooked, however much we must commend the persevering endeavour to keep alive the old traditions of line-engraving, of which this work is the result. Mr. Doo also exhibits his copy of Ary Scheffer’s picture of St. Augustine and St. Monicas (6A), which is familiar to the public, and is remarkable as a delicate and faithful reproduction of the original.

Mr. T. O. Barlow shows several prints, of which the copy of Henriette Browne’s “Sœurs de Charité” (2A) attracts most notice, as a pleasing copy in mezzotint of a clever picture, though not quite good enough for its original.

Mr. T. L. Atkinson shows “The Black Brunswicker,” after Millais (1), in mezzotint, or *manière noire*, in which he has well translated his model. The satin dress is as well

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

expressed as in the picture, every crease and glossy fold appearing as naturally as if one were looking at the work of the silkworm and loom, and not of the graver. The whole story, as told in the faces of the actors, loses nothing in leaving canvas for copper.

Cousins, S.

Mr. S. Cousins, R.A., exhibits several prints in mezzotint, after popular painters. His "Midsummer Night's Dream" (4A), after Landseer, is already well known, and possesses much merit; as also his "Louis XVI.," after E. M. Ward (4); his "From Dawn to Sunset," after T. Faed (4B); his "Order of Release," after Millais (4C); and "Saved," after Landseer (4D). But his best is certainly the "Maid and the Magpie," after Landseer (4E), in which there is much to admire; the drawing, modelling, and colour of the original are quite adequately given in the print.

Landseer,
Thos.

Mr. Thomas Landseer is an engraver who commands our respect by the simple and workmanlike style in which he sets about translating the works of Sir Edwin, in the shortest and most straightforward manner possible, without an attempt to display any other qualities than those absolutely necessary to success in this respect. He exhibits four prints, among which we must notice the rendering of the death agony of the stag in No. 12B, and the successful attempt at giving an effect of snow in "The Lost Sheep" (12A). He uses the "mixed manner" to a considerable extent, as may be particularly noticed in "Geneva—Dining Out" (12C). It is a matter of regret that so many good artists of this stamp should deem it right or necessary to employ the assistance of machine-work in their plates; the disagreeable effect of the hard, formal, machine-ruled lines can escape none but the most unobservant eye.

Robinson,
J. H. A.

It is a real pleasure to turn to the best print (among line-engravings) that can be found in the Exhibition—"The Countess of Bedford," after Van Dyck (16), engraved and exhibited by Mr. J. H. A. Robinson, A.R.A. Without doubt, this shows more of the true and beautiful qualities of a good print than any other engraving to be found in the French or English rooms in the Exhibition. It is more faithful to a lovely original, and has more of the sweet and rich effect of a well-engraved plate than any of its rivals. It gives much of the manner, and the most refined manner, of Van Dyck; the face and hands are like his faces and hands, and the colouring is like his colouring. The style is free and bold, and the drawing good. Perhaps there is a little frittering away of the light in small patches; and the silk dress is, perhaps, a little too full of reflected lights. But these are faults to be easily pardoned, while there is so much

more that is really admirable and superior to most modern attempts at line-engraving in this charming print. We are sorry that Mr. Robinson has sent no more examples of his work than this one portrait.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

Mr. C. G. Lewis shows three fair copies of pictures by Rosa Bonheur: — "Morning in the Highlands" (14), "Bouvicairos" (14A), and "The Highland Raid" (14B).

Lewis, C. G.

Mr. Lumb Stocks exhibits (21) a faithful rendering of Frith's picture, "Claude Duval," which will doubtless be as popular as the original. His print, "Nannie, wilt Thou gang wi' Me?" (21A), after T. Faed, is a better print. It is somewhat mechanical in execution, but is pretty and pleasing in tone and colour. The same may be said of his "Gentle Shepherd" (21B), after Wilkie.

Stocks, L.

Mr. W. H. Simmons shows "The Parable of the Lost Piece of Money" (19A), after Millais, in the mixed manner in which he has been faithful to his original. He has done the same by Faed's "Sunday in the Backwoods of Canada" (19).

Simmons,
W. H.

Mr. James Stephenson shows (20) a copy of Landseer's "Shrew Tamed," the only painting in the Exhibition by him; (20A) "Ophelia," after Millais; and a good portrait of Mr. Tennyson, after Watts (20B).

Stephenson,
Jas.

Mr. Chant has a print (3) in mixed mezzotint, after W. C. T. Dobson's "Plough." He has caught the serious expression of the faces, and gives very well the idea of the double meaning which seems to be intended in the painting. Otherwise, the plate is wanting in force and spirit, and is flat and smooth in effect, but will, no doubt, be popular with those who look only at the subject.

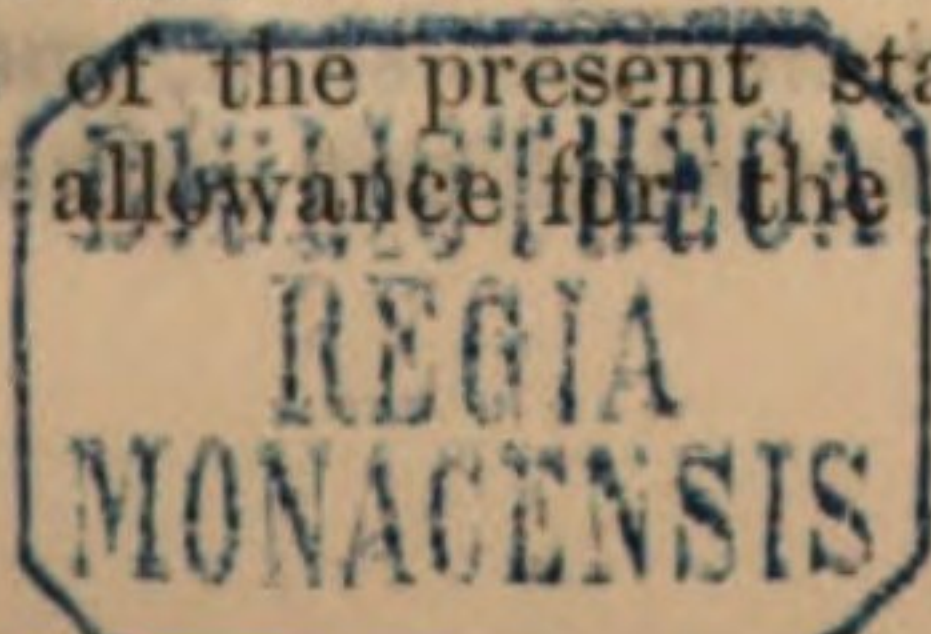
Chant.

No. 8, "The Hon. Mrs. Graham," after Gainsborough, by Mr. Graves, is a good example to show how much an excellent picture may lose, with those who are not already familiar with it, by being engraved. We are sorry to say so much of this unfortunate print, but we cannot conceal the fact that there is scarcely a trace in it of the drawing or colour of Gainsborough.

Graves.

In leaving these specimens of what is now the best style of line-engraving, pure or mixed, that we can produce in England, we will not add to the remarks we have already made, except to observe that those remarks were intended to apply not specially to most, or any particularly, of the English prints now exhibited in Paris, but more generally to the class of plates now usually engraved in England. We are happy to see few, if any, of the worst kind of "commercial" prints shown as examples of the present state of the art in this country. With all allowance for the necessities that may

Commercial
prints.



MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

Etchings.

oblige trade, and trading artists, to produce such prints, we must contend that they are not what we ought to be proud of, or to send to an exhibition as the *capo d'opera* of the engraver's art as practised in England.

We turn with satisfaction to the etchings, and only hope that many visitors may have been able to find them in the secluded nook to which they have been exiled. Many of these come from the hands of real artists, whom we are happy to see beginning again to play with the etching-needle, as used to be the custom so commonly among the older painters.

Hook, Mr.,
R.A.

Mr. Hook, R.A., shows "Sea Urchins," and "Boy Gathering Sea-fowls' Eggs" (40), which are full of his spirit and manner, and are good in colour and tone. They betray some want of familiarity with the needle, the result of which is a failure to some extent in giving the various textures of sea, rocks, &c. with sufficient distinctness. In one or two of his prints the water is expressed in a way which leaves it doubtful to which element it belongs. With this exception, these etchings are very pretty and spirited; especially the woman and child in a corn-field, in the second frame (40A) exhibited by Mr. Hook, containing three little prints.

Haden, F. S.

Mr. F. S. Haden shows a frame of four prints (39) viz., "Shere Millpond, Surrey," "Egham, on the Thames," "Lord Harrington's House, Kensington-gardens," and a "View in an Irish Forest." The first of these—an effect of hot mid-day in midsummer, a pool of water sleeping in the sun, surrounded by light and graceful poplars, and overhung by heavy beeches, with a great bird rising out of the reeds on the bank and flinging its black shadow on the pond—is at once the most highly-finished of the four, and of the entire work of Mr. Haden. It shows a complete mastery of the means and material at his command, and a love of nature which is balanced by a knowledge of the proper scope and object of etching. Mr. Haden uses the dry-point—that is, the needle itself on the polished plate, without the assistance of any acid—to a considerable extent; and, we believe, when using acid, employs it in a form scarcely if at all stronger than common vinegar. These views are evidently made on the spot, and in most cases finished at one sitting, we understand; but they do not bear the appearance of careless execution, although the work in them has been rapidly done. It is in sketches like these that we see the etcher most successful, and indeed almost as much so in plates even less highly finished than the present. It is not the province of etching to give us perfect, finished, and complete pictures, composed, studied, and worked out in the studio, as much as,

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

if not more than, in the field; it is its privilege to render the artist's impression of the moment—the look of the pond, the glen, the glade, or the river—as it strikes his eye at dawn, at mid-day, at sunset, or at whatever hour he sees and strives to catch the varying expression of nature. We sometimes cannot help wishing that the etching, thus made, were carried to a more finished stage; but it is not always by any means sure that we should gain as much as we might lose by the labour subsequently spent on the plate in the studio. Rembrandt, the great master of this delightful art, has left us many examples of both sorts, and we cannot say that his most highly-finished etchings are superior to those on which less time has been spent. Mr. Haden has felt the force of these considerations, and leaves many of his plates much less worked than the “Shere Mill Pond;” but we are far from regretting the time and pains spent upon this charming view. His “Egham,” with its calm transparent water and punts moored by the river's bank, is another delightful bit; and so is the view in Kensington Gardens, with the grass between the trees chequered by sunlight and shadow, and the house seen in the distance among the furthest tree-stems. In this last we have a very rich effect from the use of the dry-point, which we also notice in the “View in an Irish Forest.” This latter is one of the best etchings of the kind to be found in the Exhibition. It is a pity that Mr. Haden is not represented more numerously, and that the impressions of some of his prints are not more carefully selected. Of these we should specify particularly the “Egham,” which is printed too black and white, and of which we have seen much more pleasing impressions than the one here exhibited. We hope we may yet see many more works from the same hand. With such examples before us, we need not despair of rivalling the French school of etchers.

Mr. C. W. Cope, R.A., exhibits four etchings, of which the best (38) is the “Life School, Royal Academy;” in which the chiaroscuro is good, and the principal figure well and effectively sketched. In the others the drawing is occasionally careless and faulty.

Cope, C. W.

Mr. Redgrave, R.A., sends two pleasing sketches (43), the “Springhead” and “Eugene Aram,” which have some merit, though rather wanting in forcible drawing and spirit.

Redgrave, R.

The woodcuts are generally better than those shown in the French school, which appears rather to a disadvantage in this branch. Messrs. Dalziel show (24) the twelve illustrations of the parables, from the eccentric designs of Mr. Millais, cut on wooden blocks with much spirit and fidelity.

Dalziel.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

Pearson.

Measom.

Thomas.

Lane, Mr.

Belgium.

Bal, M. J.

Biot, M. G.

Demannez,
M. J.

Meunier,
M. J. B.

Mr. Pearson exhibits several clever cuts, of which the best are the heads of a fox and dog (30). The latter is a wonderfully elaborate specimen of engraving on wood, and certainly the finest cut in the Exhibition, as far as execution is concerned.

Mr. W. Measom has sent many excellent cuts (28A), scenes among the woods and on the sea; and notably a copy of one of G. Doré's illustrations of the Chevalier Jauffre. They all show great merit.

Mr. Thomas has a print after Turner (35A), "Queen Mab's Grot," the delicacy of which is surprising, when we consider the intractable material upon which it is engraved.

Among the few lithographs exhibited, we must notice Mr. Lane's portraits of Miss Helen Faucit as the Greek Muse, of Charles Fechter, and of Charles Dickens, which are the best that are shown by English artists. With these we conclude our notice of the prints sent to Paris by engravers of our own country.

In the Belgian room there are a few prints, which resemble those in the French school to some extent in style and finish. They are mostly wanting in vigour and spirit, and some have the disadvantage of being copies of pictures which have been better engraved by elder artists; such as Raphael's "Belle Jardinière," "Vierge au Voile," &c. The first of these, from the beautiful picture in the Louvre (266), is engraved by M. J. Bal in a careful spirit that does him great credit, but does not give the colour of the original, or the expression and features of the faces in the picture, with much accuracy. M. G. Biot sends three prints, of which No. 268 is "Le Miroir, Intérieur Slavaque," after Cermak, engraved in a bright, polished manner; and another (269) is from Correggio's picture at Parma, "La Madonna della Scala." The latter is rather weak and colourless, and cannot sustain a comparison with Toschi's print from the same picture.

M. J. Demannez shows two plates, of which the first (273) is from Slingeneyer's "Chrétien Martyr," a picture which is known in England, and which he has cleverly and carefully copied. The other is from Jalabert's "Romeo and Juliet," and, though pleasing and careful in execution, lacks the colour and warmth of the original.

M. J. B. Meunier contributes three, of which "La Chasse au Rat" (278), after Madou, engraved in a mixed style, is good and spirited. "L'Arquebusier" (279) also after Madou, is a quiet print, the tone of which is pleasing and the execution careful, if rather mechanical.

With these we must conclude our notice of the Belgian contribution of prints, and turn to other countries, as repre-

sented at Paris, in the hope of finding something worthy of attention. Those who will honestly search through the building for the remaining specimens of engraving will deserve credit for a very sincere love of that branch of art, and a vast amount of patience. It being our duty to find out all the prints mentioned in the official catalogue, and draw attention to any that seemed most noteworthy, we have conscientiously made this search, and have succeeded in almost every instance. Once or twice we have failed, but more often we have found, to our surprise, many more specimens than are enumerated in the book. Some we found in out-of-the-way corners, behind statues, or among architectural designs; some we found, by mere accident, in the garden in the centre of the building; and others again we found bodily transported to an annexe in the park, outside the Exhibition. We cannot congratulate ourselves on having discovered many treasures of value, after overcoming all these difficulties; but there were a few pretty prints to be found sometimes where they were least expected. We shall take the remainder of the catalogued engravings in the order in which their various native countries come in the book.

The Pays-Bas send a few prints, of which the best is from Holland. Rembrandt's "Garde de Nuit." This is somewhat mechanical in execution, but shows some appreciation of the spirit and colour of the great pointer. It is engraved (1) by M. J. W. Kaiser, who is not so successful in his attempt to render Raphael's "Prophet Isaiah," the drawing of this print being faulty and incorrect. Kaiser, M. J. W.

Prussia sends a more numerous display; but nothing of very high quality. We will mention the best of this school, beginning with the works of M. E. Mandel, of Berlin, who stands first in point of merit. He only exhibits one print (26), from Raphael's Madonna della Seggiola, which is well and carefully executed, and bears evidence of the affectionate study bestowed upon the translation of the beautiful picture. M. Barthelmess exhibits a print after M. Vautier's "A l'Eglise" (1), which is good and careful, and in which he has succeeded in giving faithfully the various expressions of the different faces. M. Keller shows a large and elaborate engraving of the "Dispute of the Sacrament," after Raphael (19), and two others, in which there is an attempt at softness and tenderness, which is not altogether successful, "Regina Coeli" (20), after Deger, and "Salvator Mundi" (21), after the same. In the first of these there is trace of careless drawing.

Mr. G. Planer shows two fairly engraved prints: in "Rembrandt and his Wife" (28), from Rembrandt's picture

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

in the Dresden Gallery, he has given us a tolerable copy of the painter's manner. The other is the "Hermit," from Kouin's picture in the same gallery. Lastly, we have some fair lithographs from the hand of M. Feckert, of which the best is a lifelike portrait of M. Ravené (17), after L. Knaus.

Hesse.

The prints contributed by the Grand Duchy of Hesse are principally the works of J. Felsing of Darmstadt, who has sent a good many specimens, only two of which are mentioned in the official catalogue. These are to be found on the wall facing the central gardens. "Capture de Jésus Christ" is a rapidly executed print, after a bad picture by Hofmann, if the copy here seen is to be trusted. "Nymphes à la Chasse à la Suite de Diane" (2), after H. Stilke, is better. The impression exhibited is from the plate when still only about half finished, but it promises to be a pretty print. A saint being carried by angels to heaven, after Mücke; "Mädchen am Brunnen;" St. Geneviève, after Steinbrück; and a Muse, after Köhler, are the best of those of M. Felsing's works which are not mentioned in the catalogue, some of which are familiar to the public. They are none of them great, either in subject or treatment; but they are pretty and pleasing, and show the hand of a clever and well-practised artist.

Baden.

The Grand Duchy of Baden sends three prints, engraved by M. Willmann, of Carlsruhe: a view of Paris, wonderfully full of detail—a perfect plan of the great town, but very mechanical in execution; and two other continental views, which are better and more picturesque.

Wurtem-
burg

The engravings and woodcuts contributed by the kingdom of Wurtemberg do not deserve attention.

Bavaria.

Bavaria sends twelve specimens, of which the best is from a picture, in a quasi-classical style, of the "Enlèvement d'Europe," by Genelli; but the drawing of some of the figures is far from being correct. The remaining eleven prints are all bad, with scarcely an exception.

Austria.

Austria is not any better represented. She sends some few prints, but none of them possess any merit.

Switzerland.

Switzerland, whose contributions are to be found in an annexe, shows some prints, of which several are not mentioned in the catalogue. Her principal artists, MM. Girardet, Merty, and Weber, appear to work principally in the mixed style, and produce a coarse and indistinct kind of effect in their prints which is not agreeable. Their subjects are evidently chosen to suit the popular taste, and that not a refined one; and they are, no doubt, successful in pleasing those for whom they exclusively work.

Spain is not represented by any engravings, she only sends a few unimportant woodcuts. The same remark applies to Portugal and to Greece.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

Denmark exhibits some rather pleasing examples by M. J. Ballin, some of which are in the mixed manner and others in *taille douce*, or pure line. To the last kind belong six little prints, the best here shown, after designs of M. Bida, made for illustrating the works of Alfred de Musset. These are very pretty and delicate. The others which merit notice are "Le Baptême," after Knaus, and "Le Bénédicité," after G. Brion.

Spain.
Denmark.

Russia sends some *eaux-fortes* by N. Mossoloff, incorrectly catalogued as drawings, which display much force and talent, though marred by an imperfect method. The engravings shown by Russia are not of any great merit. M. A. Pistchal-kine shows two prints, one from a Holy Family of Raphael and the other from the Assumption of the Virgin, by Brulow; but they are weak examples and do not possess any excellence.

Russia.

Italy sends a few prints, none of which, however, deserve much notice. The most striking is a copy by Cucinotta of the eccentric picture of "Après le Déluge," in the same gallery.

Italy.

The United States are represented by the works of several engravers, of whom the only one who deserves notice is Mr. J. Whistler. This clever and eccentric artist exhibits four-and-twenty etchings, which are truly remarkable. They rank with the best works of the French, and of Mr. Haden in the English school. He has given no names to them, but they are generally unmistakeable views in London or the neighbourhood; bits of quiet river, docks, barges, and shipping, all rapidly etched in a masterly manner. One little print represents two bargemen sitting, smoking their pipes, in some sort of balcony overhanging the river. This a most truthful and excellent sketch, and it is admirably executed. Mr. Whistler uses the dry point, like Mr. Haden, to a considerable extent—sometimes almost entirely. To this is owing the rich and beautiful appearance of many of his etchings. There are very few if any prints in the Exhibition of higher quality than these charming *eaux-fortes*.

United
States.

Whistler, J.

In conclusion we may say that it is much to be regretted that no English jurors had an opportunity of attending any meetings of the jury of this class, having no information given them by the French authorities as to the days and hours at which any such meetings were to take place; and being not even able to obtain any reply to repeated and anxious inquiries on that point. How the prizes and distinctions

Con clusion.

MR.
MARSHALL
ON
ENGRAVING
AND LITHO-
GRAPHY.

have been awarded among the various competitors* remains still to be seen; but we trust that English Exhibitors will not suffer from having had no advocates to bring forward their claims. Should this, however, be the case, the fault will assuredly not be with the British jurors, who were at their post, ready and anxious to assist in the work of deciding between rival exhibitors, during the whole time in which that work was done, without their knowledge.

* It is almost unnecessary to remark that this sentence was written early in May, when the awards of the juries were yet unknown. It is easy now to judge, from the since-published list of prizes, how far the writer's fears were well-founded.

REPORT on PRINTING and BOOKS.—(Class 6.)—By the
Rev. W. H. BROOKFIELD, M.A.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

HER Majesty's Commissioners are in possession of a report, printed at page 18 of the appendix to the catalogue of the British section, of which the purpose was to explain how the collection of books printed in Britain during the year 1866 and exhibited in Paris in the present year originated. It is not improbable that the obscure position of a report so brief in a very bulky volume may have contributed to hinder it from penetrating, or even so much as coming into contact with the public mind. It may be desirable, therefore, to repeat in few words the explanation which it contained of the origin of the collection of British books referred to.

Collection of
British pub-
lications of
1866.

Explana-
tion.

It had been proposed by the Imperial Commission that the Commissioners of Her Britannic Majesty should cause a history to be prepared of the social progress of Great Britain during the last ten years. The difficulty of giving effect to so wide and comprehensive a project is obvious. There is hardly a conceivable department or ramification in social, domestic, industrial, political, or religious life but must have had its volume in this encyclopedia, even if a single volume would have sufficed. Not an object in the world of art, of science, or mechanical contrivance but must have claimed its treatise; while in the department of printed books, whether educational and scientific or what is more properly designated "literature," the endless variety that has issued from the press in the course of ten years would have demanded the services of a legion of reviewers. It was felt, therefore, that the proposal of the Imperial Commission, however interesting, and, indeed, with sufficient time, however practicable, could not be carried into satisfactory effect before the opening of the Exhibition, or perhaps before the opening of another century. And it was resolved that the most judicious and practical approximation to a compliance with this request would be to transmit, in addition to the more ordinary materials of exhibition, a copy of every work, however trivial or however important, which had been published in Great Britain during the year 1866. These, it was considered, would furnish a very significant indication of the social progress during the last ten years of the country which produced them; and at the same time, together with the objects in fine art, applied science, mechanical apparatus, the various improvements in provision for shelter, food, and clothing,

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Many such
publications
trivial and
insignifi-
cant; but
indispensa-
ble to com-
pleteness of
collection.

Continental
collection
open to
precisely
same im-
putation of
occasional
triviality.

Opportunity
afforded of
estimating
the charac-
ter and
tendency of
the British
press.

with reports of every charitable institution in the country, would supply copious material for elaborating such a history as was desired. In order to effect this collection of books, every publisher in Great Britain and Ireland was applied to to furnish a copy of each work issued by himself. With very inconsiderable exceptions, this appeal was most promptly and liberally responded to by the immediate transmission of the loan required. Many of the books so forwarded were naturally unimportant in character, trivial in value, and devoid of any pretension to exhibition except as part of the entirety to be collected—an entirety which could have had no claim whatever to call itself a collection if any volume, however apparently insignificant, had been arbitrarily eliminated, according to the taste, the opinion, or the caprice of the person employed in the collection. The most renowned biographers and historians, moreover, teach us that it is by no means the most obscure and trivial publications of any period which afford the least important evidence, however indirect, of the sentiments, manners, and social transactions of their time; and Lord Macaulay and Mr. Thomas Carlyle have often welcomed a ballad, a pamphlet, “a full and particular account,” which has survived the butter merchant only by miracle, while many a pretentious history has been found only to darken counsel. The sole specialty which distinguished this from many Continental collections exhibited was that it was strictly limited to the productions of a single year, so that if any one should ask “What has the British press been doing lately?” here was an answer, at least so far as related to the past twelve months; an answer imperfect and inarticulate, it may be, and requiring a good deal of supplementary information to make it of much practical value; but an answer, at least, not falsified by the suppression of a single volume on account of the foolishness of its contents, the coarse and blurred condition of its type, the incorrectness of its text, or the imperfection of its binding. It will not for a moment be supposed that there were not to be found in the Continental collections volumes quite as undeserving in these respects of exhibition as the worst among our own.

With what exact purpose and under what impulse such foreign volumes were presented to the public eye, it would be unprofitable to inquire; but in the case of the British collection the motive was obvious, viz., that the answer to any inquiry as to the production of the British press might have at least the merit of being unreserved, and that our best and worst should all be presented to the eye together, so that the spectator—or the reader, if such he chose to be,—

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

might draw his own conclusions from the comparative amount and quality of publications in the various departments, educational, literary, scientific, mechanical, or religious, ministered to by the press. Into the abstract question of the advantage or the uselessness of simultaneously presenting to the eye objects which are announced to the ear it is needless here to enter. But, assuming the principle of exhibition, which surely is assumed by every contributor to the vast bazaars which of late years have almost periodically brought mankind into a focus, it is conceived that to an inquiry into the more recent pace and direction of British progress it is, if not a complete answer, at least no inconsiderable contribution to an answer, to point to these collections, and say, "Here are prepared for your inspection, " cursory or minute, the 5,000 volumes of a single year, the " serials of the same period, and the 1,200 newspapers of a " single Saturday."

It is obvious, as already observed, that in so miscellaneous a collection of prints there must have been several which, if considered not as parts of a whole, but individually, had not the slightest claim to exhibition. These were not, however, very numerous, and occupied no room that was peremptorily wanted for any better purpose, and to withhold them would have been to impair the idea and the integrity of the collection. It must be confessed that the retention of these inferior objects caused some slight perplexity to the jurors, who felt bound to deal with every article placed before them as a competitor for their approbation. They exhibited, however, no less patience than adroitness in separating the tares from the wheat, and the inferior specimens were neither so many nor so bad, nor the more brilliant ones so few, as to bring down the average of British books to anything below a very creditable standard. On the contrary, it seemed that the jury came to the conclusion that, for general "get up," for the combined effect of type, paper, illustration, binding, and durability; in short, for the collective qualities which make a printed volume what it ought to be, the average book of Great Britain was better than the average book of the Continent, but that there were individual ingredients of merit in which we were surpassed by one or other of our Continental competitors. Particular commendation was bestowed upon the typography (placing them alphabetically) of Messrs. Clowes, of Stamford Street and Charing Cross; of Messrs. Harrison, of St. Martin's Lane; and of Messrs. Spottiswoode, of New Street Square. The Bibles and Prayer-books of Messrs. Eyre and Spottiswoode were represented by specimens scarcely to be surpassed.

Comparative
average
quality of
British and
of Conti-
nental pub-
lications.

British
printers.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

The Clarendon Press of Oxford contributed also some magnificent impressions. A very costly novelty was exhibited by Mr. W. Mackenzie, of Howard Street, Glasgow, under the name of "the Prince of Wales's Bible." This unique edition, with its numerous and certainly very interesting photographic illustrations, its clear decided type, its arrangement of marginal references down the centre of the page, instead of the more usual position, right and left; its durable paper, superb binding, and its limited impression (fifteen copies)—not to mention its modest price (100 guineas)—appears not entirely unworthy of the august proprietorship which its title would seem to invite. Mr. Bagster's series, including the polyglots, must not be left unmentioned; and attention cannot help directing itself to the contributions of Messrs. Bell and Daldy, of Messrs. Blackie and Son, of Messrs. Chapman and Hall, of Messrs. Day and Son, of Messrs. Longman and Co., of Messrs. Sampson Low and Co., of Mr. Macmillan, of Mr. Murray, and of Messrs. Smith and Elder. There appeared to be an impression on the jurors that publishers who are not printers, however acceptable their contributions might be, and however commendable as objects for exhibition, were hardly to be regarded as competitors in that branch of mechanical art which they did not in fact either exercise or profess. The maintenance of this principle may have led not to the rejection, but to the non-recognition of several highly meritorious objects which must have secured some form of commendation if exhibited by the actual manipulator or by those in whose habitual employ, and with the aid of whose apparatus, material, facilities, and encouragement, his art was daily developing and perfecting itself. One case was said to have occurred of a person, neither printer, binder, publisher, nor actual bookseller, who had simply purchased certain volumes and claimed for them the right of competition. But they were not so much as looked at. It is no part of the purpose of this report to vindicate or in any respect to meddle with the operations and the verdicts of the jury. But it is not impossible that these few words of explanation may tend to allay surprise in certain cases where very valuable and deserving contributions to the Exhibition have failed to be made the subjects of any kind of comment, and so may be presumed by the friends of the exhibitors to have been overlooked or undervalued. At the same time it should be added that this remark is offered for what it may be worth, without the slightest official instruction or authority.

British
printers and
publishers.

Messrs. Bradbury and Evans, however, appear in the combined character of publishers and printers, their enterprise as printers having commenced, it is believed, with the

publication, a quarter of a century ago, of the first number of what must not, in these grave columns, be called by any shorter name than "a facetious cotemporary," whose volumes every visitor smiles to recognize as forming part of the Exhibition. This firm presents several very handsome works, chiefly remarkable for their excellent wood engravings.

In the same category of exhibitors who are at once printers and publishers must be signalled the Messrs. Chambers, who send an interesting parcel of their characteristic works. Nor should the enterprising house of Messrs. Cassell, Petter, and Galpin be forgotten, than which none better deserve the appellation of the People's Press—not more remarkable for the variety and literary merit than for the cheapness of most of its productions. Mention ought to be made of the provincial firm of Messrs. Butler and Tanner, of Frome, who exhibit some highly creditable specimens of typography. The only newspaper—apart from the collection presented by the South Kensington Museum—is the ILLUSTRATED LONDON NEWS, without which, indeed, an exhibition of the productions of the British press would be wanting in one of its most characteristic elements. Messrs. Virtue and Co., of the City Road, are conspicuous for the excellence of their steel engraving, as exhibited perhaps nowhere with better effect than in that well-known and attractive periodical the *Art Journal*. In chromolithography, or colour-printing, the foremost place is occupied by Mr. Vincent Brooks, of Chandos Street, Charing Cross; but special mention must be also made of Messrs. Hanhart, of Charlotte Street; Messrs. G. Rowney and Co., of Percy Street; and of Messrs. Day and Son, of Gate Street, Lincoln's Inn Fields, well known for their effective and brilliant illustration. Mr. W. Dickes, of Farringdon Road, Holborn, is notable for the quantity, the variety, and the cheapness of his colour-printing; and Messrs. Nelson and Son, of London and Edinburgh, produce remarkable specimens of glazed colour with the effect of oil painting—also singularly cheap, and furnishing an exceedingly pleasing decoration even for walls to which a costlier embellishment would not be unsuitable. The new art of autotypography, invented by Mr. G. Wallis, of Victoria Grove, Fulham Road, should not be passed over. By this process the artist's own drawing, when executed in the required manner, and with the proper materials, is impressed in a few seconds, by means of a special machine, upon a metal plate, even to the most delicate touches. This metal plate can be printed from at an ordinary copper plate press, or used for transfer to porcelain, &c. Several interesting specimens of the results of this ingenious process are ex-

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

British
Museum
Library
Printed
by
W. H. Brookfield

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Number of
objects and
of exhibi-
tors. Many
highly meri-
torious ob-
jects not so
specially dis-
tinguished
as to claim
enumera-
tion.

hibited. British typefounding is best represented by Messrs. Stevenson, Blake, and Co., of Sheffield and London.

Of printed books, apart from the collection of 1866 presented by the South Kensington Museum, the number of exhibitors was comparatively scanty—not numbering more than 20. The number of contributors to the collection of books of 1866 was 184, and the number of volumes collected 4,752. With reference to these, as well as to the printing, both in books and fine arts separately and independently exhibited, there is a great deal of highly meritorious work not mentioned here. The objects specially selected for remark are principally those distinguished by some unique or exceptional peculiarity in the nature of the object or in the degree of excellence attained in it; so that although an exhibitor's name obtain no special mention here, it by no means follows that his productions have been overlooked or that they have not been considered to reach, or even to exceed, the average of general quality in a class of which the British average is pronounced to be very high.

BRITISH DEPENDENCIES.

British de-
pendencies:
Calcutta,
Madras,
Bombay.

Of the colonial contributions to this class there is but little to be said. An exception, however, must be made in favour of Australia, Canada, and Bombay. From Calcutta and Madras, which in some other classes have done themselves ample justice, the art of printing, from whatever cause, can scarcely be said to have been duly represented; but in Bombay the signs of progress are very manifest. Two English and two native houses especially deserve attention: First, the Bombay Education Society's Press, of which the manager is Mr. John Frith. This establishment prints for the Government of Bombay; and the profits of the enterprise are devoted to the maintenance of the orphans of British subjects, a preference being given to those of soldiers. The second to be mentioned is Mr. Mathias Mull, the spirited proprietor of the *Times of India*. His establishment is called "The Exchange Press," and is said to have effected a very marked improvement in Indian typography.

But it would be an injustice to a remarkably deserving house if notice were not invited to the firm of Byramjee Furdonjee and Co., who are proprietors of the Duftur Ashkara Press; and to that of Nanabhai Rastamji Banina, which issues books of various descriptions, one specialty in connexion with which is that the volumes are creditable in every mechanical particular, and have been manipulated by exclusively native industry.

Canada has the advantage of two excellent printers and publishers at Quebec, viz., Mr. G. Desbaretz and Messrs. Brousseau (Frères), both of whose houses produce volumes of a workmanlike character which would do credit to any European capital.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.
—
Canada.

At each of the principal towns of Australia there is to be found printing of really first-rate excellence. At Sydney the firm of Richards, at Melbourne that of Ferres, at Adelaide that of Coxe, and at Brisbane that of Belbridge, turn out books as well got up as the most fastidious taste could desire. They print for Government, but without any subsidy from Government, of which no doubt their intrinsic merit and consequent prosperity make them independent.

Australia.

FRANCE.

One of the first names that occur to the mind in speaking of the press of France is that of M. Alfred Mame, the extent of whose enterprise, and the ability, liberality, and success with which it is prosecuted have secured for him a European reputation. As several engraved views of his extensive and admirably regulated *imprimerie* at Tours, with specimens of the typography executed there, were amongst the objects exhibited, it will hardly be travelling out of the prescribed line of remark if, in the sequel, a few observations are recorded as the result of a personal inspection of that establishment.

France: M.
Alfred
Mame.

Meantime it is difficult to convey a just impression of the vast variety of works published by this enterprising house, and occupying every gradation of quality and corresponding price, from 15 centimes per volume to 200 francs, for no less than that is the price of the Holy Bible, illustrated by Gustave Doré; of which, notwithstanding, 3,000 copies were sold within a fortnight of its publication. A very considerable proportion of the volumes published here are of a devotional or an educational character, or combining both, though there is a large supply also of works in general literature, history, art and science, travels, and biography.

It is said that a French lady changes her missal as often as her coiffure. Be that as it may, there is an enormous demand in France for prayer-books, or *paroissiens* of all sizes, qualities, and binding; and it is a specialty of this house to meet that demand at prices as various, ranging from 30 centimes to twice as many francs. "Thomas à Kempis" is scarcely less in request; and a marvel of quality combined with cheapness, pushed to the very limit of possibility, is the celebrated "Imitation of Christ," printed

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.
—

in a very clear good type and bound in sheep for 3½*d.* A very copious and apparently complete dictionary, printed in a remarkable clean and legible, though necessarily small, type (cut, it is understood, in England by Caslon), offers itself for 84 centimes; the price to the public, of course, will be slightly enhanced—but, to what extent is regulated by the bookseller. This last observation, however, does not apply to the larger and more costly publications—such as the illustrated works, of which there are here many brilliant specimens. Perhaps it may be pronounced as the most conspicuously distinctive feature in this house that quantity, quality, and price are here brought to the last point of reconciliation consistent with the mutual advantage of the producer and the consumer.

M. Claye.

In the art of printing in its more restricted and mechanical sense the palm is awarded to M. Claye (62), and such is the almost artistic excellence of his work that the most inexpert observer recognizes at once the equity of the verdict of the experts.

In M. Goupil (61) we find the enterprising and liberal encourager of line-engraving. The sums which he is said to have embarked in it during the last ten years sound almost fabulous. It is difficult to say how far the continued existence of line-engraving in France may be traceable to his fostering exertions. He employs the very best artists, men who spend years in elaborating a plate. He has felt—as how could it be otherwise?—the competition of photography; but not less a philosopher than an artist, he bends to the inevitable, and by taking up photography as part of his own commercial enterprise he has adopted the prudent stratagem of becoming his own rival.

Messrs.
Hachette &
Co.

A very distinguished place must be assigned to the house of Messrs. Hachette and Co. (1), which for upwards of 40 years appears to have been engaged in the production of works connected, for the most part, with juvenile instruction; but, which, for the last 15 years, has enlarged its orbit in order to add to its more strictly educational catalogue a daily-increasing supply of general literature, together with what has for many years been recognized amongst Englishmen under the familiar name of “Useful Knowledge.” In the educational series will be found a great variety of books which seem well adapted to their purpose—ranging from gay alphabets and pictures of all manner of objects in the world of art or nature employed in the instruction of babies in the public refuges (*salles d’asile*) onward and upward through ingenious copy-books, manuals of arithmetic, history, and geography, to the most recondite treatises of

science. From these the English educational librarian will derive many profitable suggestions. The series to which the general reader will turn, with, perhaps, keener interest, viz., that of literature and useful knowledge, commences with the great French writers of the 17th century. Amongst these will be found the letters of M. de Sévigné; the works of Malherbe; those of Corneille, of Racine, of la Bruyère; soon to be followed by Molière, la Fontaine, Boileau, la Rochefoucauld, &c. Great pains appear to be taken with the text of these works, and they are elucidated with judicious notes and accompanied by critical and biographical notices. The specialty, however, to be noticed in the series is that to every author is annexed, by way of appendix, an alphabetical list of words and phrases peculiar to the writer or to the time at which he wrote; so that a collection of these peculiar lexicons would supply a kind of history of the language of considerable interest to the philologist. The series is intended to comprise 100 volumes, and the expense attending its completion will be 1,000,000f.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

There is not room to mention even the chief amongst the republications and translations which constitute the various series in progress—literary, artistic, scientific, and philosophical; the Dictionaries, the “Miscellaneous Library,” the “Popular Editions,” the “Railway Library,” “Guides and Itineraries.” But it may be remarked, before proceeding to another exhibitor, that a “Note” which the firm of Messrs. Hachette have printed, and which gives some account of their voluminous publications, is worthy of a very careful perusal, and that it presents evidence which it would be gratuitous to impeach, that, while there is not the slightest affectation on their part of discarding the commercial element in their extensive undertakings, they are animated by a spirit not necessarily antagonistic to financial considerations, although it occupies a more exalted level, but infusing itself and its own generous quality into the commercial instinct, and causing it to act in harmony with something higher, and leading it into projects which shall result not more in the advantage of the individual than in that of the community.

M. Best is well known as the printer and publisher of what was once the rival, and is now the survivor, of the familiar but defunct *Penny Magazine*. The French periodical is remarkable, as its competitor was in its time, for the excellence of its woodcuts; but in fineness of execution (as might be expected from the advancement in the art which a quarter of a century has witnessed) it must be acknowledged to surpass its British original, as the latter in its day surpassed most of its contemporaries. It is not improbable that

M. Best.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

M. Best has done as much for wood engraving as M. Goupil has for steel and copper plate. It is said that there used to be an exchange of blocks between his house and that of the *Penny Magazine*—a friendly commerce which might be transacted still between English and Continental publishers, and probably, indeed, is to some extent, with mutual advantage. The periodical is still alive and prosperous to the extent of circulating 90,000 copies at a subscription of ten sous a month—a fraction more than a penny per week.

M. Hongard
Maugé.

M. Hongard Maugé (98) exhibits remarkable specimens of chromolithography, an art which is applied with excellent effect to the reproduction of painted windows. He is employed under the direction of the Government offices, especially by that of Public Instruction.

M. Curmer.

The specialty of M. Curmer (9) lies in religious works many of which are large, costly, and highly illuminated editions. Still more remarkable than the mechanical and artistic proficiency exhibited in the production of these superbly decorated volumes, is the fact of their being in very extensive demand, and the indication thus afforded of the current of the public taste. One work, entitled "The Gospels for Sundays and Festivals," gorgeously ornamented and illuminated, is priced at 20*l*. But the jury were informed that it commanded on its first appearance no fewer than 800 subscribers.

M. Morel.

M. Morel (17) is an artistic publisher, employing as his printers M. Claye, M. Lemercier, M. Martinet, and others of the highest class of typographers. He devotes himself much to the production of architectural works. He has published illustrations of the Palais de Fontainebleau, and is bringing out "Palais et Châteaux de la France," "Dictionnaire Raisonné de l'Architecture," "Dictionnaire Raisonné du Mobilier Français," and "Monumens Modernes de la Perse," all works of considerable artistic excellence, and (a consideration which must enter into the final estimate of every object of whatever kind) not disproportionately dear.

Being asked whether high priced publications commanded a ready sale, M. Morel replied that for the Palais de Fontainebleau he had 800 subscribers, at 300*f*. each.

M. Lièvre.

M. Lièvre (54) is a very accomplished engraver of objects illustrative of industrial art. He has a small case of specimens not so well placed, either with respect to position or aspect, as it deserves.

MM. God-
chaux & Co.

Messrs. Godchaux and Co. (41), of 66, Rue des Tournelles, have invented a very ingenious machine, by which incredible numbers of school copy-books are ruled on both sides, with engraved model writing (what we commonly call a copy) at

the top of each page. One great difficulty was to prepare an ink that should be free from stickiness, and which should become almost instantaneously dry. This difficulty having been completely surmounted, these impressions are produced upon both sides simultaneously of continuous lengths of paper in vast quantities and with great rapidity—to the extent, it is said, of fifteen million copy-books a year, consuming some inexpressible quantity of paper, the figures of which would make no more distinct and definite impression on the mind than vast enumerations usually do, and are therefore here withheld, but which result in this simple, intelligible, and, as respects improvement in handwriting, really important fact, that a very convenient and eligible copy-book finds its way to the juvenile consumer in the parish school at the price of about one halfpenny. And it may be added that if the same departmental authority which has prescribed them for the humbler elementary school could introduce them copiously and cause them to be diligently employed in schools of a more elevated character, it might tend very much to improve the caligraphy of the country, and might furnish a useful suggestion to the educational department of a neighbouring nation, whose proficiency in the homely accomplishment of legible penmanship is by no means so unimpeachable as to entitle her to despise a hint.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

In this last instance, as in numerous others, it is observable how much the system of “*specialité*” prevails in French printing, as in many other commercial enterprises, almost to the exclusion, in some cases, of more general objects. And, certainly, it must be admitted that in many respects this special and exclusive prosecution of one branch of business may tend to a higher perfection in that branch than if the energy and ingenuity bestowed upon it were more distributed. Thus M. J. Dumaine (80), of Passage Dauphine, presents a closely printed catalogue of nearly 3,000 exclusively military publications, constituting a library of that peculiar character probably much more complete than if the collection had been formed upon a more miscellaneous and comprehensive principle.

Messrs. Delalain and Son (30), of 76, Rue des Ecoles, appear to issue chiefly cheap educational books, with maps, and geographical works. M. J. Delalain presents also a handsomely printed pamphlet, containing statistics, which he has carefully prepared with reference to previous Exhibitions, but not extending to the present one.

Messrs. De-
lalain & Son.

Messrs. Bixio and Co. (29), of 26, Rue Jacob, exhibit valuable works relating to gardening and agriculture.

Messrs. Bixio
& Co.

M. Gautier Villars (25), 55, Quai des Grands Augustins,

M. Gautier
Villars.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.
—

must be distinguished as peculiarly excellent in the somewhat delicate and difficult typography employed in the service of mathematical and other science. A quarto volume made up of a leaf or two out of each of his publications as affording specimens of the various types which he employs, and of the illustrations (in wood) which he provides, not only in treatises on the higher mathematics, but in chemical, electrical, astronomical, and other scientific dissertations, represents a large series of important volumes, the mechanical excellence of which could perhaps hardly be surpassed.

M. Paul
Dupont.

M. Paul Dupont (18), of 45, Rue de Grenelle, St. Honoré, who appears to be employed chiefly for the Government departments, exhibits admirable specimens of printing.

M. Dunod.

M. Dunod (14), 49, Quai des Grands Augustins, prints for the department corresponding in some respects to our Woods and Forests (Ponts et Chaussées), and exhibits some highly commendable objects in connexion with engineering science.

M. Charpen-
tier.

M. Charpentier (4), 28, Quai de l'Ecole, the inventor of the celebrated Format Charpentier, introduced 29 years ago, and now a good deal resorted to in England for railway books, presents some valuable and interesting publications, of which the most conspicuous is an edition of the works of Alfred de Musset, whose publisher and friend he was. Upon the death of Alfred de Musset, M. Charpentier resolved in this beautiful edition of his works to erect a monument to his memory. Nor is the result unworthy of so sacred a purpose. The edition is in ten volumes; it is printed on exquisite paper, and it contains 28 engravings, of which it is hardly needful to say more than that they were designated by Bida, engraved by the best artists that could be found, and printed by Chardon (ainé). The work was published in 1866, under the auspices of 800 subscribers, of 200f. each.

M. Henri
Charpentier.

M. Henry Charpentier (64), of Nantes, is chiefly noted for illustrated works, which have secured an extensive reputation on the continent. These for the first few years of his enterprise at Nantes were naturally connected with the district of Brittany—the “Costumes of Brittany,” and other provinces of France; “The Breton Gallery,” “Nantes and the Lower Loire,” &c. But afterwards appeared “Paris in its Splendour,” “Cotemporary France,” &c.; but still interspersed from time to time with very attractive volumes originating nearer home, and illustrating the scenery, manners, and costumes of Brittany—one of the most interesting and, from not being a great thoroughfare, least explored of districts so accessible. These works continue to secure well deserved attention. The proprietor has a very large and important

factory at Nantes, the management and discipline of which are said to be such to render it well worthy of a visit of inspection.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

It would be a blameable omission to leave entirely unmentioned the firm of Messrs. Rosa and Bouret (67), Rue Visconti, not so much for any distinguishing peculiarity either in the literary or the mechanical quality of their publications (with which, however, it is not for one moment insinuated that there is any fault to find) as because of the very singular market for which those publications are, it is understood, exclusively prepared. That market is the Spanish-speaking portions of Mexico and South America. The works prepared for shipment to these districts are of the most miscellaneous character conceivable. They meet with a ready and remunerative sale. It is said that the firm have 32 houses, or, perhaps, small stalls or magazines, in Mexico alone. It would be interesting, if practicable, to trace out how so special and peculiar a commerce originated, and how it comes to be exclusively in the hands of the very respectable gentlemen here mentioned. Meantime it seems well to mention it here as a phenomenon of trade, and as an instance of the singular and unthought-of outlets that present themselves for human activity.

Messrs. Rosa
and Bouret.

Spanish
American
trade.

M. Appel exhibits a conspicuous series of emblematic labels and advertising affichés, which effect the somewhat difficult combination of sufficient showiness to attract attention and sufficient good taste to retain it.

M. Appel.

It would be unpardonable to omit mentioning the productions of the Imprimerie Impériale as amongst the best typographical objects in the Exhibition. The establishment itself is one of the most interesting sights, even in Paris. It employs about 900 workers, of whom 530 are men, 340 women and girls, and 30 boys. It has two steam-engines of 25-horse power each, only one of which, however, is in use at the same time, its colleague being reserved in case of accident. It consumes 500 reams or 250,000 sheets per day, and engages 27 steam and 80 manual presses. Nine machines are employed in typefounding, and excellent type they seem to produce. The whole establishment is in the best possible working order. Perhaps the most peculiar feature in it is a considerable sized room, of which the walls are entirely covered with cupboards consisting of many drawers, in which are deposited, in types admirably cut, the alphabets of near 100 languages and dialects of languages.

Imprimerie
Impériale.

Several typefounders exhibit in the French section specimens of printing from their types. Amongst those of the more commendable character are the productions of M. F. B.

Type-
founders.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Loeuillet, Rue du Jardinets (11); Messrs. Laurent and Deberny, Rue Visconti (17); Messrs. René and Co., Rue Madam (30); and M. Derriey, Rue Notre-Dame-des-Champs (6).

General
observa-
tions.

Before quitting the French section, the following observations, extracted from a French report upon this class, may appear sufficiently relevant to persons interested in the trade to justify their insertion here:—

“Working printers are divided into two classes—those who work by the piece, and workers by the day. Compositors on piecework receive for 1,000 letters from 55c. to 1f. 40c., according to the type employed and the language in which the copy is written. Those who work by the day are paid according to a tariff arranged by the employers and workmen, of which the lowest rate is 5f. 50c. per day for 10 working hours. The pressmen stand in the same condition, and their wages are as high as those of the compositors. The attendants on the machines earn only 4f. a day, and the children employed as assistants receive from 1f. to 1f. 50c. a day. Wages in the provinces are about 30 per cent. lower than in Paris. The employment of women in printing establishments, after having encountered great opposition, has at length been carried out, and gives very satisfactory results. The wages which they receive are nearly the same as those of the men. The great printers have established relief funds; but only one in Paris, equally prominent for the importance of his business and his personal character, has admitted his workmen to a participation of profits. The principal centres of the business are Paris, Tours, Rouen, Lille, Lyons, Limoges, Rennes, and Epinal. Strasburg stands in the second rank, and afterwards come Bordeaux, Marseilles, Grenoble, Caen, and Chatillon. The printers are divided into typographical printers—who number about 900 in France, of whom 89 are in Paris—and lithographic printers, amounting to 800, of whom 391 are in Paris. As to copper-plate printers, Paris possesses about 138. There are but very few in the provinces. The number of works printed in the year 1866, including new books as well as reprints of all works, amounted to 13,833. Of this number the belles lettres and novels formed the greater portion; political and religious works amounted to nearly 2,000; history, geography, voyages, and travels to 1,500; scientific works, 1,800; works on commerce and agriculture to nearly 1,000. The production of engravings, lithographs, photographs, plans, maps, charts, and drawings of all kinds amount to about 30,000; to which must be added 9,000 publications of vocal and instrumental music. There are also printed in France 1,774 periodical

publications, of which 336 are political journals, and the remaining 1,436 literary, scientific, and miscellaneous. Immense improvement since 1855 will be observed in type cutting and founding, in chromolithography, in stereotyping (especially by the galvano-plastic process), in the construction of steam presses, and in the net result of all these means."

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

ALGERIA.

Although Algeria presents nothing remarkable in typography, taken in its mechanical sense, there is a moral interest in such symptoms of social progress as Arab copy books and other provision for instructing the indigenous rising generation of the colony, which gives 12 exhibitors.

Algeria.

THE NETHERLANDS.

Amongst the exhibitors from the Netherlands, 19 in number, must be noted Mr. Sythoff, who shows books in Chinese, Japanese, and other Oriental languages, with which the Dutch were in some degree familiar for a considerable time before our own country became acquainted with them. A similar description of volumes is presented by Mr. Brill of Leyden, and by Messrs. Enschedi and Son, of Haarlem.

The Nether-
lands.

BELGIUM.

Twenty-two exhibitors from Belgium contribute an interesting assortment of chromolithographs, of books, and other typography. The two most remarkable features, however, in the collection are, first, the combined cheapness and quality of the books, and, second, the large proportion of religious books and missals that are to be found among them, indicating a corresponding element in the public demand. Both these features are conspicuous in the cases of Messrs. Brepois and Diercks (Turnhout) and of Mr. H. Dessain, the proprietor of a very old-established house at Malines. For good and careful printing, however, as seen from a mechanical point of view, no exhibitor in this class, perhaps, deserves more honourable mention than Mr. C. Annoot-Braeckman, of Gand. All the objects in his case are presented for exhibition, it is believed, now for the first time, nor does there seem any reason to doubt the honest boast of the exhibitor that they are fair average specimens of his habitual and ordinary workmanship, and as little specially got up for this great occasion as it was in human nature to content itself with. As a typographical curiosity, "The Annals of the Elzevir Press" deserves particular notice. Some mathematical treatises are

Belgium.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

remarkably well printed, and a collection of the books published by the Flemish Bibliophilist Society will not be passed over by those who take an interest in printing and its progress. Mr. C. Lelong, of Brussels, presents very creditable specimens of wood engraving, and of prayer-books in French, Flemish, and Spanish prettily got up and singularly cheap.

PRUSSIA.

Prussia.
Leipsic.
Messrs. F. A.
Brockhaus &
Sons.

The Royal Press of Berlin exhibits good specimens of surface-printing for maps by heliography. The person in attendance was chary of information as to the particulars of this process, but the results, as represented in the maps and bank-notes exhibited, was satisfactory. Messrs. Wieweg and Son, of Brunswick (13), are renowned throughout Europe for the excellence of their scientific publications. For typography in its mechanical sense, probably Mr. Decker, of Berlin (7), is not surpassed in Germany. His "Evangile," "The Works of Frederick the Great," and "Danté" deserve particular attention. In the very highest rank of printing houses, not of Germany only, but of Europe, must be placed that of Messrs. F. A. Brockhaus and Sons, of Leipsic. Their establishment is represented to be upon a considerable scale, and to comprise a very choice and still extensive store of both German and foreign publications. They have a type foundry of six furnaces and 12 machines; they employ 10 manual and 17 steam presses; they have ample apparatus for various kinds of stereotype, as well as for the galvanoplastic process, together with all needful appliances for various other branches, such as lithography, wood engraving, bookbinding, of their comprehensive enterprise, and they find employment for nearly 600 hands. In a case of objects so well selected as theirs there are few but must prove interesting to some observer or another, according to the bias of his mind. The assortment is miscellaneous, but remarkable for its apparent tone of substantial utility. If it be desirable that one work should be specified where so many deserve mention, probably the one most obvious for such distinction may be the "Conversation Dictionary," better, however, known, even in England, by its native designation, "Conversations Lexicon," of which no fewer than 300,000 copies are in circulation. An eleventh edition is now issuing, and is to be completed towards the end of next year. It is believed that this work has had the effect of turning a considerable portion of the literature of Germany into a peculiar channel, which directs itself to the popularizing of science. But in the exhibition by Messrs. Brockhaus there are, in truth, few objects to which special mention would be inappropriate, and

no house could more suitably sustain their position as the representative of their own branch of commerce in Leipsic, which has so long been the great Continental emporium of printed literature and science.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Messrs. Giesecke and Devrient, of Leipsic (22), produce a great assortment of decorative printing in almost all its varieties of typography, lithography, engraving, and galvanoplastic impressions. Their speciality, however, or at least the one which it is best worth while to point out to British emulation, is that of having raised a peculiarly trivial and unimportant class of printing, viz., labels, affichés of advertisement, posting bills, and the like to a really artistic branch of trade, characterized by a considerable degree of attractiveness both in emblematic devices and in form and colour, so that the victim of a puffing announcement has at least the consolation, however slender, of having been imposed upon by something pretty. With these the productions in the same line of the French exhibitor, M. F. Appel, very creditably compete, and have been already mentioned. There are some others, however, not far distant from these, but originating in another and more insulated quarter, sufficiently resembling them to suggest comparison, but not sufficiently attractive to sustain it.

Messrs. Gie-
secke &
Devrient.

The type foundries of Messrs. Trowwitsch and Son, of Berlin (8), and of Mr. Dresler, of Frankfort-on-the-Maine (19), appear to supply excellent type.

The printed music of Messrs. Breitkopf and Härtel, of Leipsic (18), merits commendation, but should, according to arrangement, be considered in Class 10, to which perhaps it more properly belongs.

HESSE-DARMSTADT.

From the duchy of Hesse-Darmstadt there are but three exhibitors; all, however, highly creditable. Mr. Keller, of Geissen (2), more especially in letterpress; Mr. Koehler, of Darmstadt, for engravings and chromolithographs; and M. Beyerle, of Darmstadt (1), for educational works, which may probably attract attention in Classes 89 and 90.

Hesse-
Darmstadt.

BADEN.

In the three exhibitions in this class from Baden there is little that challenges particular observation.

Baden.

BAVARIA.

Among 11 exhibitors from Bavaria the principal element is artistic, as displayed in sundry specimens of oleography,

Bavaria.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

crystalotype, &c. Several handsomely got up missals and other highly decorated works are scarcely an exception to this prevailing quality. As in Belgium, the cheapness of some of these articles is extraordinary. Mr. Bruckman, of Munich (3), Mr. Pustel, of Ratisbon (7), and Mr. Kosel, of Kempten (8), are conspicuous.

WIRTEMBERG.

Wirtem-
berg—Stut-
gard.

Wirtemberg, as represented by its capital, Stutgard, has long maintained in the south of Germany that supremacy in the book trade which Leipsic holds undisputed in the north. The northern emporium boasts the house of Brockhaus; Stutgard that of Cotta (2), so well known for his edition of the German classics. From the honourable prominence which he secured years ago he has not receded, but continues to be the efficient representative of the literary commerce of southern Germany. In the fine arts Messrs. Ebner and Seubert, of Stutgard (5), are conspicuous; and the lighter kinds of literature are advantageously exhibited by Mr. Hallberger, also of Stutgard (8). But there is probably no more interesting object in this section than the Bible printed in relief for the blind by the Wirtemberg Bible Society, in 63 volumes, price only 5*l.* 2*s.* 10*d.* The cheapness and utility of this valuable production may justify the following notice of it, extracted from the descriptive catalogue:—

Bible for
the blind.

“The printing of this Bible was begun with the Gospel of St. Luke, about the year 1840. Then the Psalms were printed, and subsequently the whole of the New Testament. The latter was completed in 15 volumes in the month of August 1859. In the spring of 1863 the whole of the Scriptures was issued, in 63 volumes, and in a number of copies sufficient to satisfy the wants of all the blind in Germany. Till the year 1856 the printing was executed at Stutgard. After this time Mr. Alphonse Köchlin, director of the asylum for the blind at Illzach, in Alsace, who is himself blind, took it into his hands. The several books of this Bible were disposed of singly in about 5,000 copies—viz, in 1861, 261 copies; 1862, 339; 1863, 738; 1864, 201; 1865, 566; 1866, 806. Of these 5,000 copies, Wirtemberg took about 1,000; the rest were sent for the most part to Prussia, Saxony, Hanover, Bavaria, Frankfort; and a smaller number also to Switzerland, to Alsace, and to Russia. A complete copy was sent, upon demand, to China. The copies were mostly sold at a price covering two-thirds of the expense; but many were given away gratuitously. The

large familiar Latin letters which have been chosen for the printing of this Bible have this advantage—viz., that such blind persons as at a former time enjoyed the gift of sight and knew their alphabet, will at once recognize these characters; and that those born blind can be easily taught by anybody acquainted with them, even by children. These are advantages which neither the system of Moon (using a kind of stenographic character) nor the system of Braille (sometimes called the dotting system) possesses, for both of them require to be learned anew by the teacher, like a new alphabet."

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

AUSTRIA.

From Austria 42 exhibitors contribute many interesting objects, amongst the most prominent, even if the less important, of which are the interiors of the Palaces of Vienna and Schoenbrunn, executed in coloured lithography by the Imperial Press of Vienna (1). A more remarkable issue from the same establishment, and unique for its historic and artistic interest, is a brilliant work, illustrated in chromolithography of very high character, representing the vestments, jewels, and other regalia of German sovereigns, from the remotest days accessible to research. The linguist will hardly fail to be attracted by the specimens of the types employed in the languages of Turkey, of Persia, of Thibet, of Arabia, of Greece, of Portugal, as well as in the Zend and Hebrew tongues; all which have been cut and founded (as in Paris) within the walls of the Imperial Press. But it is probable that a more really substantial service has been rendered to social progress in a very unpretending volume upon stenography as applied to telegraphic communication, from which considerable results are not only not impossible, but by no means improbable. The name of this little book is "Oesterreichische Blätter für Stenographie." "The Voyages of Discovery of the Austrian frigate Novara in the years 1857-8-9" is a beautifully illustrated work.

Austria.
Cheap and
attractive
prints—
coloured
and plain.

Mr. Braumuller, of Vienna (2), enjoys a well deserved reputation for his scientific publications; Mr. Gerold, jun., also of Vienna (14), for every variety, as indicated in his copious catalogue. Mr. F. Paterno, of Vienna (30), presents attractive objects in copper-plate, lithography, and chromolithography; those last mentioned especially being of such extraordinary cheapness as not to be above the purse and cottage of the peasant, and yet quite pretty enough for a less homely destination. In the same branch of printing (chromolithography) must be mentioned Messrs. Reiffenstein and Co., of Vienna (32); Mr. Neumann, of Vienna (29); and

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.
—

Mr. Holtzel, of Olmutz; all of whom produce coloured pictures of singular cheapness and considerable beauty.

Amongst other creditable specimens of printing, Mr. Zamarski, of Vienna (42), presents a Hebrew Bible of admirable execution.

SWITZERLAND.

Switzerland. In this class Switzerland is but imperfectly represented. There are, indeed, but eight exhibitors, of whom Mr. Bridel, of Lausanne (1), may be mentioned for creditable books; and Mr. Brunhofer, of Otten, Soleure (2), for pretty views in water colour.

SPAIN.

Spain: ex-
cellent
specimens.

The exhibitors for Spain are only nine in number, but among them is one of first-rate excellence, viz., Mr. Riva de Neyra, of Madrid (7), who contributes the works of Cervantes and a small edition of "Don Quixote," which would do credit to any printer. Messrs. Gorchs and Casadevall, of Barcelona (6), show a large edition of "Don Quixote," of which the execution does not exceed the pretension. The Ministry of the Interior send the works of the commission organized for the publication of the monumental remains in Spain—a project certainly of interesting and extensive purpose, and one which might be expected to enlist into its service very efficient artists.

PORTUGAL.

Few speci-
mens, but
of the
highest
quality.

Portugal furnishes only four exhibitors in this class, but of these four each one deserves highly favourable mention. It was with visible gratification that the jury found themselves of one mind in their commendation of the productions of the most important of the arts of peace in a country whose geographical and political position imposes some degree of wholesome restraint upon less beneficial if more dazzling kinds of enterprise. It was considered that the typography of Portugal is nowhere excelled. Nor is this just tribute to be paid only to the national establishment, though that is naturally the most prominent of the printing houses of Lisbon. It is evident that the individual exhibitors take pride in their work, and do it conscientiously and well. Creditable specimens are also contributed from the distant press of Goa, to which Portugal gave the art of printing precisely 307 years ago.

GREECE.

Greece.

It may excite a moment's surprise when it is remembered how much smaller a number of exhibitors some

larger countries have contributed that there should be no fewer than ten to indicate the intellectual activity of Greece. It is not necessary to be severely precise in criticising the material workmanship of the objects shown ; but it is amusing to discover that Great Britain has not been alone in exhibiting her newspapers, but is fortified by the example—or the imitation—of a country which, in its day, has not been entirely without influence in furnishing mankind with models for emulation.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

DENMARK, SWEDEN, NORWAY.

The printed specimens from Denmark, Sweden, and Norway had been subjected to so little classification that there was a difficulty in inspecting them. The typography and illustrations of Mr. Bianco Luno, of Copenhagen, are good. The "Sweden, Ancient and Modern," of Mdlle. Thersner, of Stockholm, and the "Selection of Norwegian Literature of the last few years," of Mr. Botten Hansen, are interesting. But all the objects from these kingdoms were seen at a disadvantage.

Denmark,
Sweden,
Norway.

RUSSIA.

Of the eleven exhibitors from Russia Mr. Orgelbrand, of Warsaw (8), merits distinction both for his moveable type and stereotype. Mr. Lehman also, of St. Petersburg, sends creditable specimens of printing, as does the printing establishment of the Finland Literary Society of Helsingfors (6), and Mr. Golovine, of St. Petersburg (4). But there is comparatively little in this class of the Russian section which calls for special observation.

Russia.

ITALY.

To the prevailing mediocrity of the 53 Italian exhibitors Mr. Pomba, of Turin (3), is an exception. His is probably the first house in Italy ; and it has produced several fine works. There is a moral interest, if no great typographical excellence, in the production of the "Pères Mechitaristes" of St. Lazare et Venice, a fraternity of the Armenian communion who support their institution by printing. It appears that "Mechitar" (the Armenian equivalent to "Consoler") is a kind of title assumed by, or conferred upon, various Armenian celebrities, the most renowned of the name having been Peter Mechitar, the founder of this monastery, who originated a printing press in it for Armenian literature, translated the Bible into that language, and, after

Italy.

The "Pères
Mechita-
ristes."

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.
—

various vicissitudes, died in Venice, 1849, aged 74. The works, translated and original, printed by this fraternity are very numerous and almost as miscellaneous. They comprise the Bible, an A B C book, the fourth canto of "Childe Harolde," "Telemachus," Armenian grammars and lexicons, Goldsmith's "Rome," "Paul and Virginia," "Thomas à Kempis," several European grammars and dictionaries, "Homer," "Horace," "Virgil," "Paradise Lost," and "Plutarch's Lives." These, with at least 400 more in the Armenian tongue, bear witness that the good fathers have employed their learned leasure not unprofitably, and afford a glimpse into an obscure, but not insignificant, sphere of human industry sufficiently interesting, perhaps, to justify this slight digression. Mr. Lemonier, of Florence (19), sends a selection from a very varied and extensive library. Mr. Sonzogno, of Milan (31), enjoys the distinction of being publisher of 13 illustrated and two plain newspapers.

EGYPT.

Egypt.

His Highness the Viceroy of Egypt contributes remarkable specimens from the Government press at Boulak, accompanied by treatises, both in print and manuscript, on subjects so incongruous and miscellaneous, though important, that it might look almost like jesting to recite them. Conspicuous amongst them are those on medical and veterinary practice, on various sciences, with poetical and religious works suggestive of interesting social considerations in connexion with the venerable soil of Egypt.

UNITED STATES.

United
States.

If the United States have not contributed so much that is remarkable to this as to some other classes in the Exhibition, nobody will attribute it to a deficiency of activity and enterprise in this as in all other industries. Mr. D. Appleton, of New York (7), appears to be producing an important work under the name of the New American Cyclopaedia. The National Bank Note Company show characteristically excellent specimens of their peculiar productions.

PAPAL STATES.

The Papal
States.

The Papal States contribute nothing whatever to this class.

HAWAII.

Hawaii—
past and
present.

But to those who measure the importance of an object not so much by the large figures which may be required to

express its bulk, its weight, its force, its cost, as by the evidence it supplies of the advancement of humanity in that moral amelioration which is the best result of material progress, there is perhaps no portion of this huge bazaar which will be viewed with kindlier interest than that contributed by the remote kingdom of Hawaii, the land of a lady whose name not long ago became familiar to English ears, and who won golden opinions from all sorts of people while she stayed among us, under the title of Queen Emma, one of the Queens Dowager of the islands, and sister-in-law to the present King Kamehameha V., who succeeded his brother, her deceased husband, in 1863. It is not quite 90 years since Captain Cook was clubbed to death upon the principal of these islands by a horde of naked savages, no better and no worse than other Polynesian aborigines. There seems no reason to believe that the tragic fate of this noble seaman was aggravated by the consummation of human ferocity and degradation, for he had friends and admirers among the natives, who did such honour as they could to his remains. But still neither those who, under some casual irritation, were his murderers nor his friends were in any respect superior to the neighbouring tribes, whose most appetising esculent when they could not fasten a quarrel on a wife or on a grandfather was a prisoner of war. It is but 40 years since the rudiments of Christianity—partly the cause, no doubt, and partly the pretext of incidental elements of civilization—began to insinuate themselves by very slow and up-hill paths into these and other not very distant groups of islands. In those days their contributions to a museum or exhibition would have been their uncouth instruments of slaughter, with fish bones for iron; their terrible clubs; their ghastly grinning trophies of war; and, for the less repulsive decorations of peace, pendants of finger bones that had strangled the wearer's intended and necklaces of teeth that had masticated her relations. The articles exhibited to-day are several newspapers ("Nupepa"), both in English and in the vernacular, with their births, deaths, and marriages, shipping news, advertisements of stage coaches, merchandise, concerts, and philanthropic meetings; with leading articles, and the sonorous editorial "We." And besides periodicals we find several standard productions of the local press—a code of laws, a grammar, a dictionary, a spelling book, an A B C book. And it is said that there is scarcely a child among this people—for they are now no longer a clan but a people with their constitutional hereditary monarchy and a sovereign of enlightened patriotic character—but can read

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

better than could those English nursemaids who were spelling out their valentines, or more likely waiting for some competent interpreter to do so, on the morning of that Feb. 14, 1779, at the very hour when the great adventurer was beaten to death by the natives of this remote spot on the Pacific to which his discovery of it has proved so immeasurable a blessing. It will not, however, escape the observation of the inductive mind that a volume of "Law Reports" indicates that the kingdom of Hawaii has not been entirely exempted from some of the inconveniences of civilization.

Many extensive and well governed establishments in the book trade, both British and foreign, but by instructions, attention is here specially directed to a foreign one.

In a commercial department which has reached such enormous proportions as the book trade of Europe, it necessarily arises that a number of extensive establishments have formed themselves, employing so many hands as to constitute important and interesting dependencies, consisting in several cases of upwards of 1,000 men, women, and children, for whose comfort, health, and welfare, both moral and material, their employers, in the very act of organizing such a community, make themselves to no small extent responsible. The mere possession of such a responsibility is highly honourable, whether derived from hereditary fortune or slowly attained by personal industry and enterprise; but the faithful, paternal, and humane discharge of it is surpassed in magnitude only, and not in essential nobleness, by that of the most exalted functions of civilized life. Of course there are similarly large establishments in other commercial sections, but in none more notably than that of printing, in which the higher degree of intelligence required in most of the operatives employed naturally renders their supervision and guidance a more interesting though not a more obligatory duty.

It would have been very pleasing to the writer and interesting to the reader of these observations to dwell a little in detail upon the judicious and efficient provision made in this kind in several of the large printing houses in Great Britain, conspicuous amongst which would stand that of Messrs. Clowes, of the *Times* newspaper, and of Messrs. Eyre and Spottiswoode, and several others. In the last-named establishment it would have been agreeable to draw attention to the fact that they have not limited their beneficial projects to sick clubs and provident associations; but by encouraging cricket, boating, and other manly and robust amusements, and by instituting a copious lending library, excellent schools, and occasional lectures, besides a

very flourishing choral society, have made provision for the pleasantness of life as well as for its prolongation, and for the instruction of the mind as well as for bodily recreation.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

It would have been a grateful duty to invite emulation to these provisions in the establishments just named, and in several other of our leading printing houses. But in the instructions laid down for the guidance of reporters to Her Majesty's Commissioners it is expressly prescribed that "the British report should have special reference to the objects exhibited by the British colonies and by foreign countries rather than those exhibited by the United Kingdom, although the latter should not be overlooked." It is presumed that this limitation will extend not only to remarks upon the objects actually exhibited, but to observations also incidentally and by the way recorded upon the establishments out of which those objects issue; for it can hardly be irrelevant to invite attention, though only incidentally, to those arrangements and regulations of the factory, whether moral or mechanical, between which and the comfort of the operative the consequent efficiency of his labour and the value of his production, there is an intimate and even vital relation. The instinct of international courtesy would be apt to point in the same direction as this instruction to reporters, and to suggest the selection of some Continental rather than domestic establishment as an object for generous emulation; and, while several other factories in the same industry may possess an equally irreproachable organization, and each be distinguished by some special characteristic of its own, no one, perhaps, could with more propriety be selected as a representative establishment—whether regard be had to the extent of its enterprise, to the apparent health and comfort of its operatives, or to the fact that these remarks are the result of personal observation—than the imprimerie of M. Alfred Mame, at Tours.

The press of M. Alfred Mame is said to issue daily about 20,000 volumes—including, it must be understood, under the word volumes the two extremes, and all the gradations lying between the costly folio appraised by hundreds of francs and the little story-book for children purchased at 5c. The factory employs within its walls about 1,000 hands, many of whom are women, girls, and boys; besides an almost equal number working at their own homes, in the town and neighbourhood of Tours; not to mention the occupation less directly afforded to independent industry, such as that engaged in the preparation of skins for binding, the founding of types, the manufacture of ink and paper, and various auxiliary productions.

The factory
of M. Alfred
Mame at
Tours.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Personal
comfort of
the opera-
tives.

Perhaps there is no feature about this establishment which deserves earlier notice than the admirable care which has been bestowed and the liberal provision made for the personal and material comfort of the persons employed within its walls. Certainly, for arrangements of this kind the pretty town of Tours presents facilities with respect to space which overgrown cities can hardly be expected to afford. But the judgment, the good taste, and, it may be added, the humanity of M. Mame have turned these facilities to an account which well merits emulation in other factories as well as in those devoted to the production of books. Of these huge rooms, from ground floor to third story, in each of which are employed numbers varying from 100 to 400 persons, all are well warmed in cold weather and well cooled in hot, and well lighted and ventilated at all times. The surface of window work is very large in proportion to the walls; and from every window the eye rests on something green and cheerful in the way of garden, trees, or grassplot. In some of the larger rooms a handsome fountain plays at each end, and sustains a perpetual current of fresh water in a circular trough 3 feet above the ground, for washing, and in jets placed 2 feet higher, for drinking. There is a suitable supply of matrons—themselves also diligently employed in folding, sorting, or the like—to chaperon the girls; and the boys also are duly looked after; and, as the prevalent, though not the exclusive, rule of the house is payment by the piece, the alertness and industry of all engaged are very marked, and in many cases the rapidity and adroitness of manipulation very surprising. The employment, too—not even excepting that of the press room—being of a nature which does not necessarily bring the worker into contact with anything either soiling or unwholesome, there is a general air of neatness in dress and cleanliness in person, as well as of healthy cheerfulness of expression and demeanour, prevailing throughout this busy multitude of all ages and both sexes which is not only a very pleasing feature in the eye of a casual visitor, but must also be attended insensibly in its process, but undeniably in its result, with the most important moral effect. Conducing also to this end are numberless little signs of decoration and convenience too trivial to mention in detail, but all indicative of a spirit which recognizes the moral duty as well as the economical prudence of rendering labour pleasant as well as profitable, which in this excellent establishment it is; and which, in normal circumstances, it everywhere and always ought to be.

Amount of
work re-
quired never
oppressive.

The appointed hours for labour are not exceeded, even under extraordinary pressure, sudden and exceptional demands

being met by the engagement of supernumerary hands. There is no compulsory suspension of work, nor any night work, while there is also the unvarying observance of Sundays and other festivals as days of remission.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Disputes about wages, which are elsewhere a too frequent cause of altercation between employers and employed, have never yet disturbed the tranquillity of this establishment, the principal of which appears to have been the first concerned to take into consideration the price of provisions and other legitimate elements in such a question; so that the rate of wages as a grievance is never heard of; and the city of Tours remembers the sacrifices imposed upon himself in the year 1848 by M. Mame in order to keep his workmen employed (or paid if not employed) at a crisis when political disorganization disturbed for a time to their centre all the commercial arrangements of the country.

Wages.

The average of wages here is 4f. per day to men and 1f. 50c. to women. This is considered a somewhat high rate for a provincial town and in a factory where there are no days of suspension of work for which to make deduction from the weekly payment. But this liberal dealing is by no means the only advantage enjoyed by these numerous artisans.

There are two benefit clubs, largely supported by the proprietors, one for the behoof of the printers, and the other for the binders, who in sickness receive 1f. 75c. per day, with medicine and attendance. There are also two funds for retirement in old age, which are supported entirely by M. Mame in the way of payments deposited by him yearly in the national fund established for the same purpose. These payments are made with reference to each individual employed, and are proportioned to that individual's standing in the factory. Thus, for one who has completed five successive years of service there is paid 10f. per annum; after 10 years of service, 30f.; after 15 years, 50f. This method of assurance, into the minute details of which it may be needless to enter, is so calculated that a person entering the establishment at 18 years of age might retire at 60 with an income of at least 600f.

Benefit
clubs.

Supplementary to these provident funds is another, supported also exclusively by M. Mame, the purpose of which is to supply gratuitous medical assistance to such of the wives and children of the men employed upon the premises as may need it. Besides all this, the assistance in kind distributed by M. Mame's family among the more necessitous and heavily charged of the workmen is said to be exceedingly bountiful, and the doles of bread and meat

Dispensary
for the
families of
operatives,
&c.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

and fuel in the more rigorous seasons very copious; so that, upon the whole, it may be hoped that the operatives in this establishment are sheltered as securely as human foresight, contrivance, and benevolence can devise from the severer predicaments of indigence.

Moral pre-
cautions.

Nor have the moral exigencies of so large an institution been neglected. Each branch of the business has its special superintendent, and each superintendent his or her suffragans, who maintain a discipline as strict as is at all necessary or consistent with the unmistakable comfort and cheerfulness of those at work. As to silence—where so many are engaged “by the piece,” and therefore have a personal interest in accomplishing a competent result in a kind of work which giddiness, noise, disorder, indeed, of any kind would be peculiarly liable to throw into irretrievable confusion—such silence as is desirable is pretty certain to maintain itself without any vexatious exercise of authority. The male and female workers are employed, not necessarily in separate rooms, but in separate portions of the same enormous room and under the eye of their respective superiors. Their hours for leaving and returning to the building are different, and the yards and staircases are so arranged as to admit of no probability of their meeting.

Drunken-
ness un-
known.

Drunkenness has been entirely extirpated from this establishment. That peculiar development of hagiolatry which in England is sometimes celebrated in adoration of “St. Monday” is here entirely obsolete, and there is no longer any instance reported of more than at most eight or ten workers (out of 1,000, be it remembered,) arriving at the building later than the prescribed hour on the morning after some extraordinary festivity in which they may have assisted.

Schools for
children.

Especial care is taken of such children of the factory as are of an age to receive primary instruction, in which the religious element is scrupulously encouraged; and their industry and good conduct are kept under continued stimulus by the weekly distribution of suitable rewards.

Marriages between the men and women employed here are of increasing frequency, from which one interesting result is that there are many households in which, after the youngest children have attained a few years of age, the entire family—father, mother, and children—numbering six or seven individuals, become occupied in the factory, exercising their industry under the same roof or even in the same room, clubbing their earnings together, and realising a really comfortable income.

A considerable amount of employment in folding and sewing is reserved for workwomen whom domestic exigencies compel to stay at home, and about 150 mothers of families are thus occupied in their own dwellings.

It is pleasant to reflect that there is no ground for apprehension that this prosperous, serviceable, and, to the working class of Tours especially, beneficial establishment is exclusively dependent on the energies of a single individual, or that it must fall to pieces whenever M. Mame—hardly yet in the noon of life—may feel disposed to change the incessant activity of commercial enterprise for the charming repose which he has provided for himself at a few miles distance from the spot where it has been so well and justly earned. It is now eight years ago since he associated with himself M. Paul Mame as partner in the business, and there is every indication that a share in this profitable commerce is not the only advantage which the father is transmitting to the son. There can be no doubt either of the purpose of the latter or of his ability to maintain the establishment in the same spirit, on the same principles, and with the same efficiency as have been set before him in the honourable example of his father.

And there is, perhaps, nothing more honourable than to provide full work and full wages for as large a number as practicable of persons craving both; especially if to this be added such guidance, assistance, and advice as to the execution of the work and the disposal of the wages as the relations of employer and employed, with a due consideration for the self-government and independence of the latter, may justify; and if, by contriving the means, and affording facilities, and suggesting experiences, and presenting a salutary example, an employer induces the more dependent classes to adopt such habits, such precautions, such principles, such practices as conduce to make body and soul in their respectively moral and material sense more clean, more healthy, more happy, more secure, both as respects their present and their future necessities, the individual so favoured in his co-operation with Divine Providence must be emphatically pronounced a friend of man, and is entitled to a great deal more than the utmost which these columns can afford him, viz., “honourable mention.”

It was one of the instructions to reporters that they should confer with the jurors and delegates of their respective classes, and obtain from them such information as might facilitate the preparation of their reports. If there be anything in the foregoing observations which can repay

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

Employ-
ment for
those who
are com-
pelled to
stay at
home.
Hopeful
prospects of
perpetuity
to the
establish-
ment.

Acknow-
ledgment.

REV. W. H.
BROOK-
FIELD ON
PRINTING
AND BOOKS.

perusal it must be mainly attributed to the valuable assistance rendered by Mr. Rivers Wilson, of the Treasury, juror in the class, than whom no gentleman can have imported into his function a more conscientious assiduity, a more shrewd discrimination, or a happier blending of the two mutually corrective qualities of equity and kindness.

REPORT ON PAPER, STATIONERY, PAINTING AND DRAWING MATERIALS, and BOOKBINDING.—(Class 7.) — By J. W. APPELL, Esq.

MR. APPELL
ON PAPER,
STATION-
ERY, &c.

THE objects falling within the seventh class are manifold, and it may be said that this class has a rather miscellaneous character. If we take "Stationery" — this is by itself a class embracing a multiplicity of articles, as envelopes and ornamented letter paper, writing and copying inks, inkstands, pens and penholders, manifold writers, sealing-wax, paper-knives, &c.; and by some exhibitors the term seems, moreover, to have been taken in the widest sense possible, since we find amongst the writing materials not only a revolving lamp shade, but even cigar-cutters, besides a number of things which might be better described as writing toys. One branch of industry is, however, included in our class the importance of which is very great, and continually becoming greater—paper-making. Paper, as every body knows, is one of our chief means for promoting civilization. Liebig, in his Familiar Letters on Chemistry, says, "the quantity of soap consumed by a nation would be no inaccurate measure whereby to estimate its wealth and civilization." It may be observed with equal, or even with more truth, that the consumption of paper in a country marks its stage of progress. For, with the spread of knowledge and literature, and the growth of the "press," with the development of industry and commerce, the demand for paper for printing and writing, as well as for wrapping and packing, and sundry other purposes, will unfailingly increase. And it could be quoted as a remarkable statistic fact, that the leading London journal alone consumes more paper than a whole province of the kingdom of Spain.

The exhibits of paper are naturally very numerous. Samples have been sent from twenty-one countries (amongst which Prussia and the other States of the North German Confederation are reckoned as *one*), while at the great Paris Exhibition of 1855 fourteen countries only were represented. But it would be rash, indeed, to form conclusions as to the state of paper manufacture in the respective countries from the share they take in this year's Exhibition. Of the 392 licensed papermakers who were found in the year 1865 in the United Kingdom not more than twelve came forward as exhibitors; and the number of exhibitors from some other

Samples of
paper.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

countries does not correspond much better with that of the manufacturers.

As the characteristic feature of paper-making now-a-days—a feature which already appeared pretty strongly at the former International Exhibitions, and has become still more conspicuous at the present one—we have to note those cheap and inferior sorts of paper, not made from rags, or containing but a small portion of rag fibre. While the price of paper has fallen, the price of rags has risen considerably, and in some countries almost doubled, within the last thirty-five years; and there has been often an apprehension of the scarcity of this time-honoured and as yet unequalled raw material, which cannot be produced at will. Different paper-making stuffs, therefore, have been introduced as substitutes in order to satisfy the vastly increasing demands for paper without any increase in cost. Straw and esparto, or Spanish grass,* have of late years come into extensive use; and the statistic tables show that in 1865 52,324 tons of esparto and other vegetable fibre were imported into the United Kingdom. But *wood* is now also used on the continent in large quantities. We find that several countries exhibit samples of wood-paper. Of especial interest are those sent by Heinrich Vœlter, of Heidenheim-on-the-Brenz, in the kingdom of Würtemberg. This Suabian exhibitor is the inventor of a successful method of making from wood a cheap paper-pulp which is pretty white and clean, without being bleached. His process—for which he obtained patents in almost every country of Europe and in North America—was already invented at the time of the first London Exhibition; but he has since then essentially improved it, and it is now adopted not only by large paper manufacturers in Prussia, in the other Zollverein States, and in Austria, but also in Belgium, France, Switzerland, Sweden, Norway, Denmark, and Canada. One of the paper-mills in Northern Germany consumes yearly 10,000 cwt. of wood-pulp. And it may be said that hardly a newspaper is printed in Germany the paper of which does not contain some portion of this material. The paper manufactory at Poix, near St. Hubert, in the Belgian part of Luxemburg, belonging to the “Société anonyme de l’Union des Papeteries,” has ten machines constructed after Mr. Vœlter’s patent. There is also a paper-maker in this country who works with one of Vœlter’s wood-pulp machines—Mr. Weiss, of Morpeth, Northumberland.

Wood-
paper.

* Esparto (*Spartium seggareum*) grows in mountainous and uncultivated districts on the Mediterranean coast of Spain. It is also found on the north coast of Africa, where it is called by the Arabs *alfe*, or *alfa*.

In an economical point of view, Voelter's invention must be considered of no small importance. The cost of the pulp produced from wood, according to his method, is stated to be *nowhere* more than one-half the cost of the rag-pulp, and still less in some places where there is a large supply of wood and water-power. It must be admitted that the wood papers are by no means of a superior quality; but they are rather tough and well adapted for common use, particularly the printing-papers. Mr. Voelter exhibits specimens of various sorts:—white and coloured printing-papers, containing from 25 to 70 per cent. of wood-pulp (the remainder being rag fibre); common tinted drawing-papers, containing 35 per cent. of pine-wood pulp; writing papers of various colours, containing from 30 to 50 per cent. of wood-pulp; an ordinary blue letter-paper, containing 50 per cent. of pine-wood pulp, pleasant to write upon and taking the ink easily; coloured papers for book-wrappers, containing from 30 to 50 per cent. of pine-wood pulp; besides tissue-papers, paper-hangings, and cardboards.

In the Würtemberg annexe, in the park, one of Voelter's machines is to be seen in motion, crushing the wood and making the pulp. It is worked by 50 horse steam-power.

Other samples of wood-paper have been sent from Russia by J. C. Frenckell and Son, of Tamerfors, in Finland; from Sweden by D. O. Francke (Rosendahl Mills), of Gothenburg; from Portugal by Joaquim de Couto, of Feira, in the province of Beira; from the United States by Jessup and Moore (Rockland Mills, near Wilmington, Delaware); and from England by the Teams Wood-pulp Company, Gateshead. The American firm exhibits printing-paper of a fair quality, containing 10 per cent. of pine-wood pulp, and another sort containing 40 per cent. of poplar-wood pulp. The English company shows some pulp from pine-wood, which is of good colour, but strongly bleached.

No novelty in paper-making is, in fact, to be noticed in the present Exhibition, but we perceive even from a cursory view of the exhibits, that the principal improvements in the manufacture have of late years become more and more universally adopted; and that nearly every country where there is any progress of industry can now produce excellent machine paper. At the same time, we find that in England and elsewhere hand-made paper has not been yet supplanted entirely by machine paper. To particularize the merits of single manufacturers would be a difficult task, the more so since a great number of exhibits is only to be seen through glass cases, and we must therefore confine ourselves to

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

mention briefly the most distinguished exhibitors of the various countries.

UNITED KINGDOM.

English
exhibitors of
paper.

Among the few exhibitors of paper, card- and millboard which are to be found from the United Kingdom, two firms of an established reputation received gold medals:—Thomas H. Saunders, for his beautifully water-marked hand-made and machine-made bank-note and other security papers, the excellence and peculiar strength of which have been long acknowledged; and Alexander Cowan and Sons, who exhibit writing paper of the first class. Silver medals were awarded to James R. Crompton, of Bury, Lancashire, for his white and coloured tissues, which are considered to be as perfect in texture and pure in colour as any in the Exhibition; and to W. S. and R. Portal (Laverstocke Mills, Hampshire) for their bank-note paper. John Lamb, of Newcastle-under-Lyne, who exhibits pottery tissue-paper for printing and transferring patterns and designs on porcelain, remarkable for its great strength, received a bronze medal, as well as W. W. Morley, of Wooburn, Bucks, whose millboards, made from rope, are of known superior quality. Of the Teams Wood-pulp Company honourable mention was made.

FRANCE

French
exhibitors of
paper.

has naturally the largest number of exhibitors. There are about eighty. Two of these—a partner of the firm of Blanchet, Brothers, and Kléber, of Rives (Depart. Isère), and Auguste Doumerc—were members of the jury, and therefore could not compete for any mark of distinction. To one exhibitor a gold medal was awarded; 18 exhibitors received silver medals, and 23 bronze medals.

Blanchet, Brothers, and Kléber exhibit machine-made papers, which are highly commended for their cleanness, brilliancy of colour, and hard sizing. Their photographic papers are reputed to be the most uniform in texture and purity of all papers prepared for the photographer. A. Doumerc, director of the Société anonyme des Papeteries du Marais et de Sainte Marie (Seine and Marne), displays very thick and beautiful printing and lithographic papers, and pressboards. The eminent firm of Lacroix, Brothers, of Angoulême, who received a gold medal, has sent a large assortment of papers—fine drawing-paper, writing, printing, photographic, and cigarette papers, and also security paper.

made for the Turkish Government. Canson and Montgolfier, of Vidalon-lez-Annonay (Ardèche), another well-known and large firm, show specimens of good tinted drawing-paper, of tracing and photographic papers, and other sorts, besides artificial parchment. Bréton, Brothers, and Co., of Pont-de-Claix, near Grenoble, exhibit papers of a high class for copper-plate, lithographic, and coloured printing, as well as an imitation of China paper, already known from the Exhibitions of 1855 and 1862, which affords clear and delicate impressions of engravings. Outhenin-Chalandre, Son, and Co., of Besançon, exhibit writing-paper, paper for lithographic printing, and other papers of current saleable quality, very well sized and well adapted for their purposes; Latune and Co., of Blacons (Drôme), hand-made account-book and drawing papers of a fair quality; Bécoulet and Co., of Angoulême, various sorts of writing-paper of a second class, well sized in the vat; J. B. Bichelberger and Co., of Clairefontaine (Vosges), among other papers, extremely good cartridge paper; F. Johannot, of Annonay, account-book paper, letter paper, drawing and tracing papers; Vorster, of Monfourat (Gironde), good writing paper, besides drawing, account-book, and cigarette papers.

MR. APPELL
ON PAPER,
STATION
ERY, &c

The total number of persons employed in the manufacture of paper in France is at present about 34,000, and above 129,000,000 kilogrammes of paper are yearly produced.

From the

NETHERLANDS

we find but two exhibitors. G. J. Palm, of Beekbergen, in the province of Guelders, has sent hand-made paper of different sorts, which is rather failing in clearness, but strong and "sound," like the famous old Dutch paper.

Dutch
exhibitors of
paper.

BELGIUM.

The Belgian papermakers, who are well known to produce the current sorts of paper at low prices, are represented by ten exhibitors. But among these we miss Godin, Brothers, who are the largest paper manufacturers of Belgium, and probably the largest in the world, for they employ above 1,500 persons, and produce yearly paper to the amount of 4,000,000 fr. The Basse-Wayre and Gastuche Paper Manufactory, in the province of Brabant, to which a silver medal was given, exhibits writing, printing, and packing paper, and pasteboards. Olin and Son, of Brussels, show, besides

Belgian pa-
permakers.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

printing and other papers, samples of the materials used in the manufacture in the various stages of the process.

PRUSSIA.

Prussian
and Saxon
exhibitors
of paper.

There are twenty-five exhibitors from Prussia and the other States of the North German Confederation.

Hoesch, Brothers, of Düren, near Aix-la-Chapelle, have made a highly creditable display of papers of various sorts—namely, wove and laid letter papers, of three different qualities; Indian-sized account-book papers, which are extremely strong; cigarette papers; and splendid tissue papers, in above sixty different tints. The prices of their papers are low with respect to the quality. This eminent firm was, however, debarred from competing for a medal by the circumstance that one of the partners acted as a member of the jury.

We have next to mention the two firms Felix Heinrich Schöeller and Heinrich August Schöeller, both of Düren. They both exhibit white and tinted writing papers, and cardboard papers. H. A. Schöeller has adopted the English method of sizing with animal size, and his papers are remarkable for strength and solidity.

Other distinguished exhibitors are:—Schmitz, Brothers, of Düren: they exhibit paper dyed in the stuff; W. F. Ebbinghaus, of Letmathe, near Iserlohn, well-sized writing and drawing paper; Ebart, Brothers, of Berlin, excellent hand-made and machine-made papers, besides very perfectly glazed millboards; Philip Hüttenmüller, of Lorenzdorf, near Bunzlau, in Silesia, pressboards of various qualities and thickness; Philip Schnell, of Volkmarshausen, near Münden, coloured paper, highly glazed, and remarkable for the fixity of the colours, which are not easily washed off; C. F. August Fischer, of Bautzen, in Saxony (who manufactures largely for the whole Zollverein), papers of superior quality for copper-plate, steel-plate, and lithographic printing.

WÜRTTEMBERG.

Papermannu-
facture in
Würtem-
berg.

From this little kingdom four exhibitors have come forward. The paper mill "Zum Bruderhaus," at Dettingen, near Urach, deserves particularly to be mentioned. This mill was established in 1862 by the missionary preacher Gustav Werner, of Reutlingen, for the support of his philanthropic institutions, and employs about 200 persons. A silver medal was awarded for the papers exhibited from the "Bruderhaus"—namely, good wove and laid letter

papers, both white and blue; writing and account-book papers, besides unsized paper in rolls for telegraphy.

Of Mr. Völter's exhibition we have already spoken.

There are at present in Würtemberg 20 establishments, with 28 machines, besides 29 establishments employing only manual labour. About 158,000 cwt. of paper are produced in the year.

MR. APPELL
ON PAPER,
STATION-
ERY, &c.

AUSTRIA.

The paper manufacture in the Austrian empire has of late years made considerable progress. The number of paper-makers in the year 1865 was 263; fourteen only of them have contributed to the Exhibition.

Austrian
paper-
makers.

Smith and Meynier, of Fiume, show samples of beautiful machine-made drawing and writing papers, which are perfectly well sized. This firm produces yearly from 200,000 to 230,000 reams of paper, and exports to the Levant, to South America, and some of the British colonies. The number of persons employed is stated to be from 600 to 800. Mr. W. C. Smith, an Englishman, and Mr. C. Meynier, a Bavarian, erected the mill in 1827, at a short distance from the city of Fiume; and they were the first who introduced into Austria the making of paper by machinery.

Machine-made papers of superior quality have also been sent by the following firms:—L. F. Leidesdorf and Co., who produce yearly about 40,000 cwt. of paper, part of which is exported to the East; Franz Lorenz, Sons, of Arnau, in Bohemia, who exhibit fine letter, writing, and tissue papers; Eichmann and Co., of Arnau; Gustav Röder and Co., of Marschendorf, near Trautenau, in Bohemia, who exhibit letter paper, writing paper, and boards.

DENMARK.

To M. Drewsen and Sons, of Silkeborg, in Jutland, a silver medal was awarded for their writing paper, which is with great perfection glazed in the web.

SWEDEN.

Four exhibitors are to be found. Excellent filtering-paper has been sent from the Grycksbo Papermill (J. H. Munktell), at Falun.

RUSSIA

has eight exhibitors. For writing paper a silver medal was awarded to A. F. Wasenius, of Tervakoski, in Finland.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

ITALY.

Silver medals obtained—L. Jacob and Co., of Roveredo, and Pietro Miliani, of Fabriano, an old seat of paper manufacture. The former exhibit writing papers; the latter has sent hand-made printing and lithographic, drawing, and account-book papers, and boards.

An exhibition worthy of especial notice is that of

JAPAN.

Japanese
papers.

The Japanese, as the reader will perhaps recollect, use principally for making paper and paper-cloth the bark, and also the wood, of the paper mulberry tree (*Broussonetia papyrifera*), the fibres of which are extremely tenacious; and their excellent paper—of which there are 90 different sorts—serves them for a variety of purposes unheard of among Europeans, even in this paper age. They not only paper their rooms, as we do, they also have paper garments, paper handkerchiefs, raincoats and umbrellas of oiled paper; and despatch-boxes, reticules, tobacco-pouches, and other objects are made of a paper imitating leather; yea, even soldiers hats in Japan are of paper, and considered to be sword-proof. A very good collection of samples of Japanese papers, of various colours, has been contributed to the Exhibition, and excites great interest, as does everything coming from that country, still so imperfectly known to us. There are gold-spangled and embossed complimentary papers; a large and very thin writing-paper, which in Japan is sold (to foreigners) at the price of 60c. a sheet; and another paper, as stout as cardboard, ornamented with gold figures, sold at the price of 4f. a sheet. There is the handkerchief paper, the price of which is from 2c. to 7c. for 10 sheets; gelatine paper; a wrinkled wall-paper; paper for screens, sold at the price of 97c. for 10 sheets; paper made to imitate morocco, &c. There is besides paper-cloth, as strong as leather.

Writing
materials
from Ben-
gal.

Japanese writing pencils and inks in cakes are likewise to be seen; and we will just mention here that the Exhibition offers altogether very interesting specimens of writing materials from the Far East. When we turn back from Japan to the Indian Department, we find among the objects sent from Bengal the primitive reed-pen of the natives, as well as the reed itself, from which it is cut. We also find specimens of the leaves on which the Indian books generally are written. These leaves, dotted with gold, are from 1 ft. to 1½ ft. long, and several inches broad. The

method of writing on them is singular. The Hindoos, after having formed the characters on the leaf, rub them over with a preparation of oil and charcoal, which renders them distinct and quite indelible.

MR. APPELL
ON PAPER,
STATION-
ERY, &c.

Fancy Papers and Envelopes.—The manufacture of fancy papers is one of those minor branches of industry in which the Parisians peculiarly excel. They show, indeed, much ingenuity and great taste for the combination of colours in those marbled, gilt, silvered, embossed, block-printed, laced papers, used for various purposes, as well as in fancy paste-board boxes, which are an almost exclusively French article. E. Chagniat (who manufactures for about 200,000*l.* in the year), E. Vacquerel, H. L. Maquet, A. Almin, may be named as principal exhibitors. Two German houses distinguish themselves also in a high degree in such coloured and ornamented papers, Schæfer and Scheibe, of Berlin, and W. Knepper and Co., of Vienna. To both of these firms silver medals were awarded.

Fancy pa-
pers.

Envelope-making has within the last twenty or twenty-five years become quite an extensive manufacture; and the old method of folding the envelopes by means of a “bone folding-stick” has long been found inadequate. In England an ingenious envelope-folding machine was invented in 1844 by Mr. Edwin Hill, conjointly with Mr. Warren De la Rue, and additions were made to it by the latter in 1849. This machine makes 2,700 envelopes per hour. In France envelopes are now also folded by machinery. The Parisian exhibitor C. A. Legrand produces yearly 250,000,000 envelopes. A. Marion and Co., another eminent manufacturer of stationery, has a hundred different sizes of envelopes to show. Both these exhibitors received silver medals. To J. Bouillotte-Dobignie a bronze medal was given for envelopes. A Prussian firm, Hoffsümmer, Brothers, of Düren, likewise obtained a bronze medal for good machine-folded envelopes, some remarkable for cheapness. It is much to be regretted that the London manufacturers Messrs. De la Rue and Co., in whom the French exhibitors of stationery would have found a formidable rival, have not taken part in the exhibition.

Envelopes.

Painting and Drawing Materials.—In oil colours, painting-brushes, varnish, and other materials for the artist, the pre-eminence of the French is acknowledged. E. F. Haro, J. M. Paillard, Pinondel, Duret the elder, are prominent

Artist's
colours.
Painting
brushes.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

among the Parisian exhibitors for colours; J. A. Besse, Bullier, A. Renault, Pitet and Lidy for painting-brushes. The English manufacturers George Rowney and Co., of Oxford-street, London, whose cheap and finely machine-ground water colours are well known, obtained a silver medal. To James Newman, of Soho-square, and Reeves and Son, of Cheapside, bronze medals were awarded. There are also two Bavarian exhibitors who received bronze medals—Karl Kreul, of Forchheim, for machine-ground colours, and G. C. Beisbarth and Son, of Nuremberg, for brushes of superior quality.

Lead
pencils.
English
exhibitors.

We find four English exhibitors of lead-pencils. Among these E. Wolff and Son, of Great Queen Street, London, and B. S. Cohen, of Magdalen-row, London, obtained bronze medals. A silver medal was awarded to the successors of the late artist William Brockedon (W. Brockedon and Co., of Great Ormond Yard, London). They still carry on Brockedon's process for consolidating graphite dust from the famous Cumberland mine into solid blocks, which contain no other substance but the Cumberland graphite. In the French section, two firms received silver medals for excellent crayons—Humblot-Conté and Co., of Paris, and Gilbert and Co., of Givet, in French Flanders—both of them manufacturers of an established reputation.

French
Exhibitors.

Bavarian
lead-pencil
manufac-
turers.

The lead-pencil manufacturers of Bavaria, more especially of Nuremberg, have long been famous, and play again an important part, as they did in all the great industrial exhibitions. A. W. Faber, of Stein, near the old Franconian "town of toil and traffic," received the only gold medal awarded for lead-pencils. This exhibitor, who has much improved the processes of pencil making, may indeed be called the lead-pencil manufacturer par excellence. His manufactory, first established in 1761, is the largest of the kind. He employs above 500 persons, and produces about 346,000 pencils in the week. A great variety of blacklead and coloured pencils is displayed in his case; and of very excellent quality are those sorts of his lead-pencils made from the natural graphite, which was discovered not long ago in Siberia, near the Chinese frontier, by an enterprising Frenchman, Mr. Alibert. It will be remembered that at the London Exhibition of 1862 pencils of this new material were for the first time offered to the public. We have been informed that since then Faber has obtained possession of the whole Siberian mine. Slates are also exhibited by Faber. They come from the factory at Geroldsgrün, in Upper Franconia, another establishment of

this firm. There are cheap school slates, more pleasant to the eye of young folks than the dull-looking ordinary ones, and therefore worthy of imitation—slates with gaily-coloured border ornaments, alluding to the feasts of Christmas and Easter, and with appropriate adages.

MR. APPELL
ON PAPER,
STATION-
ERY, &c

The other distinguished Bavarian exhibitors of lead-pencils and crayons are:—J. S. Stædtler, of Nuremberg, a firm established since 1782; Berolzheimer and Illefelder, of Fürth, near Nuremberg; M. Nopitsch, of Schweinau, near Nuremberg; and, last not least, J. J. Rehbach, of Ratisbon, who employs above 300 persons, and produces more than 1,500,000 dozens of pencils in the year.

Austria possesses in Bohemia a source of graphite particularly suited for making lead-pencils. Joseph Hardtmuth, who had established in Vienna a pencil manufactory as early as 1787, but had for some time obtained the black-lead from England, first availed himself of this Bohemian material, in the year 1800. His house is still flourishing (now L. and C. Hardtmuth, since 1847 at Budweis), and exports to Russia, England and France pencils, the superior quality of which is sufficiently acknowledged. The amount of Bohemian graphite yearly manufactured into pencils by this firm is stated to be 1,000 cwt.; and about 1,500,000 dozens of pencils and crayons are produced in the year. Besides their pencils, L. and C. Hardtmuth exhibit an assortment of recommendable elastic artificial black slates, as well as white ones (so called "weisse Pergament-Tafeln"). The average number of such slates yearly made by the firm is 20,000 dozens.

Lead-
pencils from
Bohemia.

As a novelty in the Exhibition we have lastly to note the drawing-pencils sent by the American Lead Pencil Company, of New York, which has been established only two years ago. These pencils, of intense blackness, are made from American plumbago, specimens of which are likewise exhibited. The founders of the American establishment were workmen of Faber.

Pencils from
American
plumbago.

BOOKBINDING.

Among the exhibits of bookbinding not a few specimens of ornamental binding of the higher class are to be met with, showing a praiseworthy adaptation of good design, which denotes the general advance of taste in our day; and it must be acknowledged, real excellence in workmanship is also to be discovered. But we have certainly much to

Book-
binding.

MR. APPELL
ON PAPER
STATION-
ERY, &C.

regret that some of the best known binders do not appear with their productions. In the section of the

UNITED KINGDOM

Exhibitors
from the
United
Kingdom.

we miss, for instance, Francis Bedford, of Gloucester Street, London, whose name is familiar to all book-lovers of the metropolis, and who had won for himself the highest opinion of the international jury in 1862. Robert Rivière, another London binder of great repute, is not a direct exhibitor. There are, however, some bindings of the latter to be found amongst the exhibits of the sixth class—namely, fine specimens of tree-marbled calf, exhibited in the case of Whittaker and Co., and another binding in the case, which contains the Calendars of State papers, published under the direction of the Master of the Rolls—the two volumes of the fac-simile of the Domesday Book. These volumes are stoutly bound in choice undyed leather—Mogador goat skin of rare solidity—with tooling of a fine bold character, and brass mountings. The tools are reproduced from ancient books in the cathedral library of Durham; the designs for the mountings were made by the late Godfrey Sykes, the decorator of the South Kensington Museum; and the whole binding may be considered as a very remarkable example in the Early English style.

Joseph Zæhnsdorf, of Brydges Street, Covent Garden, London, has sent a selection of bindings, which deserve to be commended for beauty and variety of design. We see in his case imitations of Old English calf bindings, volumes in the monastic style, in Early Florentine mosaic binding, in the elegant styles named after those great amateurs, Thomas Maioli and Jean Grolier, &c.; and especially conspicuous is a specimen of Early Missal mosaic binding (the Bible, illustrated by Gustave Doré), with the crown of thorns as centre ornament of the side.

The other more or less distinguished exhibitors from the United Kingdom have chiefly sent specimens of “useful” binding, and of “stationery binding.”

Marcus Ward and Co., of Belfast, who received a silver medal, show specimens of their excellent account-books in vellum and substantial Levantine morocco, which combine neatness with great durability. They also exhibit decorative bindings in various styles, besides photograph-albums, memorandum-books, and even betting-books for the “patrons of the turf.” To Letts, Son, and Co., of the Royal Exchange, London, a silver medal was awarded for their account-books

and diaries, which are favourably known to the great public. Among those firms who obtained bronze medals we will only mention:—John Ramage and Co., of Wells Street, Jermyn Street, London, in whose case a good specimen of flexible binding is to be seen; A. W. Bain, of Frith Street, Soho, London; and Joseph Causton and Sons, of Eastcheap, who exhibit strongly and well bound account-books.

MR. APPELL
ON PAPER,
STATION-
ERY, &c.

With regard to the rapidly produced cloth binding, which has in this country for about thirty years supplanted the unsightly “board” binding, it may be observed in general that the foreign work does by no means yet equal the English. The English cloth-work is, in most cases, not only made of superior material, it also shows more variety of colour, and far more variety and appropriateness in ornamentation. Cloth can, of course, never be considered as a satisfactory substitute for leather; but the immense advantages of cloth binding for the publishing “trade” are the cheapness and dispatch with which the literary productions of the day can be got ready for the public. It is stated that if a London house eminent in this line should receive from the publisher 5,000 volumes upon Monday morning, they can all be put up in cloth covers, lettered and gilt “within the incredibly short period of two days.” Pattern of excellent bookbinders’ cloth are exhibited by two London firms—Law and Sons, of Monkwell Street, and J. L. Wilson, of St. John Street, Smithfield.

English
cloth-bind-
ing.

FRANCE.

That France would make a beautiful display of luxurious bindings was to be expected. The eminence of the French bookbinders in their taste and execution has always been universally admitted; and there is besides, just at the present day, among the fastidious amateurs of the French capital a greater fancy for fine toiles of books than probably ever was; so much so, indeed, that at the public sales the most worthless trash will almost with certainty fetch a high price, if dressed up by some famous binder-artist. The foremost Parisian binders—Trautz, the son-in-law and successor of Bauzonnet, Lortic, and others—have, however, not contributed to the great show in the Champ de Mars. Alfred Mame and Son, the well-known large publishers and printers of devotional and juvenile books, of Tours—who have an elegantly-fitted-up stall in the vestibule—take this time the first rank among their co-exhibitors, French and foreign. This house has issued, besides its publications for the French “million,” a series

French
book-
binders.

A. Mame
and Son.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

of sumptuously printed books with illustrations, and choice vellum copies of some of them, of the Bible, illustrated by Doré, of a new edition of La Bruyère's Characters, &c., are to be seen, encased in morocco and mosaic bindings of the most careful finish. The correct taste and the extraordinary precision with which these beautiful volumes are tooled, commanded the high consideration of the jury; and Messrs. Mame received the only gold medal awarded for bookbinding. Very creditable are also the less elaborate bindings of small prayer-books in Messrs. Mame's stall, while their cheapness cannot fail to surprise the visitor.

Gruel-
Engelmann.

A brilliant collection of bindings—and, in fact, the most attractive to the general public in the whole building—is that of Gruel-Engelmann, of the Rue Boissy d'Anglas, Paris, an eminent house, conducted these last seventeen years by M. and Mdme. Engelmann, whose productions had already obtained much notice at the Exhibitions of 1855 and 1862. In the show case which belongs to this firm we find books elaborately and tastefully decorated with reliefs in gold, silver, and other metals, with jewels, enamels, and ivory carvings—really precious art-objects. These are, of course, not books for the library shelves, but for the drawing-room table, the great lady's "Prie-Dieu," or her jewel shrine, almost too precious to be used. Several "Livres de Mariage," i.e., prayer-books intended for wedding gifts, in the richest and choicest covers, arrest chiefly the attention; and amongst them we must point out a small illuminated MS. on vellum, bound in light red morocco, with ornaments of chased and enamelled gold, in the middle of the cover two hands clasped in each other, and holding the letter S, the initial of the Latin word *semper*. This binding is a successful reproduction of that of the Book of Hours of Catherine de Medicis, purchased in 1864 by the French Government at the Duchess of Berry's sale, and now belonging to the Musée des Souverains in the Louvre. There are also books with wood-carvings, amongst which every sportsman will behold with pleasure a sporting register in folio, the property of the Count d'Osmond, ornamented after an original design—on the cover the family group of a wild boar, finely carved, the corner plates showing boars' heads, the clasps being formed by the paws of the animal in brass. A copy of the Emperor Napoleon's "Life of Cæsar" (a book which figures rather prominently in the Exhibition) has a binding in antique style, inlaid with coloured leather, and mounted with a cameo head of the great Roman. Gruel-Engelmann, however, produce not only books with such costly decorations, but the "classic" styles of bookbinding are likewise

well executed by this house, as is to be seen from some small volumes, bound in strict, simple taste, without tooling of the sides—a style which the French call “à la janséniste,” on account of its almost rigid simplicity.

MR. APPELL
ON PAPER,
STATION-
ERY, &c.

Before we take leave of Gruel-Engelmann's exhibition, we will not forget to mention that Mdme. Engelmann, whose first husband was the binder Gruel, is herself skilled in the binder's craft; and that, with the exception of the jewellery, every part of the bindings is done in the workshops of the firm.

R. Petit, a Parisian binder of considerable note, is only represented by an elaborate binding of the Emperor's “Life of Cæsar,” which is enriched with precious stones, and has found its place among the exhibits of French jewellery (Class 36). A. Lenègre, another noted binder, displays elegant and well-finished ornamental bindings, as well as very cheaply got up books in plain grey cloth, besides photograph-albums and note books. J. Engel and Son's specimens of cloth binding are considered to be the best among the French cloth-work. F. R. Grumel's photograph-albums deserve particular attention for beauty of design and superior finish.

There are, besides, several French exhibitors who either received bronze medals or of whom honourable mention was made:—Cottin, the nephew and successor of Simier, “Relieur du Roi,” who shows bindings in ancient and modern styles; A. Longuet, who exhibits bindings of devotional books, drawing and photograph albums; L. Lesort, in whose case some expensive mosaic bindings are to be found; E. Cornillac, who presents prayer-books bound in various styles; and others. Among the numerous account-books and the *grands livres*, which have been sent, very well-bound specimens are, no doubt, to be seen; but some of them must fill the visitor with wonder and astonishment. We mean those gigantic ledgers loaded with brass or steel mountings, which appear to us to be rather an incumbrance than a protection or ornament of the books.

In the Belgian section, J. C. E. Schavye, of Brussels, the King's binder, has made an exhibition of carefully-executed reproductions of ancient and modern styles, to represent the various epochs of the history of bookbinding, from A.D. 1400 down to our time.

The Belgian
exhibitor,
Schavye.

AUSTRIA

has several distinguished exhibitors. Karl Girardet, of Vienna, is here first to be named, although his bindings, so striking for their splendour, are to be found in Class 26,

Bindings
from Aus-
tria.

MR. APPELL
ON PAPER,
STATION-
ERY, &C.

amongst the fancy leather articles. Beautifully designed and executed is the cover of a missal, in mediæval style, with jewelled gold ornaments, made for the Emperor Francis Joseph. This binding of Girardet, and a magnificent album by him, mounted with gold and enamels, belong undoubtedly to the most attractive works in the Exhibition. The designs for Girardet's album, in which great purity of style prevails, were made by Edward van der Nüll, the Viennese architect and Professor of Ornamental Art of the Imperial Academy. Anton Batsche, of Vienna, has sent a splend album, executed after his own designs. F. Rollinger, of Vienna, and Karl Louis Posner, of Pesth, are also exhibitors who should not be overlooked. Both of them display richly-ornamented bindings, as well as solidly-bound account-books, elegant note-books, and albums.

The Belgian
exhibitor,
Schayve.

of Belgium
from Ant-
werp.

REPORT on APPLICATIONS of DRAWING and MODELLING
to the COMMON ARTS, including DESIGNS for INDUSTRIAL
PURPOSES, &c.—(Class 8.)—By R. REDGRAVE, Esq.,
R.A.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

HAVING been requested to report on the exhibits in this class, I found, on examination, that, with the exception of France, few countries have largely contributed designs; while the models and reproductions in aid of art-education are also few, if we except the collection of geometrical solids and those illustrative of force and motion from Darmstadt, and the splendid and unequalled contribution, by our own Government, of reproductions of objects of art, sent from South Kensington, I have, therefore, thought it would conduce more to the instruction of those visiting Paris, for whose use these papers have primarily been prepared, to make the subject of this report, the art-education of the designer, as contrasted with that of the artist, in this and in other countries; rather than to enter upon any detailed examination of individual objects. In the Exhibition the visitor may easily compare the results of the art-teaching of each country, and also the reciprocal action that has arisen from international exhibitions on French as well as on foreign taste.

Report prin-
cipally di-
rected to
art-educat-
ion.

Even taking this as the substance of my report, I have found the direct contributions from the various countries in illustration of it very few. France exhibits the designs of some of her best decorative artists; but, on this occasion (in Class 8), none of the works of the students in her various schools, either in Paris or the provinces, nor as far as I was able to ascertain at the period of my visit, in any other part of the Exhibition. I may, therefore, have to refer to the great gathering of the works of these schools made by the Union Centrale des Beaux Arts appliqués à l'Industrie, in 1863, in the Palais de l'Industrie, and shall from time to time speak of the few exhibits from other countries in Class 8, as I find it necessary to illustrate my views, and to compare them with our own system, tersely illustrated in the collection sent from South Kensington, and the works from an individual school (that of Lambeth) connected with the department (Class 8, No. 17), and exhibited by its master, Mr. Sparkes.

Before entering upon the present state of art-education, it may be well to revert shortly to the past relations between

Relations
between
artist and

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

art-work-
man in the
Middle Ages.

fine art and the arts as applied to industry. In the Middle Ages and at the period of the Renaissance these relations were exceedingly intimate; the distinction between artist and designer had hardly arisen. The great German, Flemish, and Italian artists were not only the painters of altar-pieces, nor employed alone in decorating the walls of churches with the history of saint and martyr; but they designed the furniture of palace and church, the rich services for the banquet, the reliquaries, monstrances, chalices, the splendid candlesticks of the altar-table, even the hangings of the rooms and the robes of the priests. The architects were often at the same time both painters and sculptors; nor did they disdain to design, and often partially to execute, the inferior decorations of the buildings they erected. Some of the most celebrated sculptors were equally celebrated as workers in metal, as delicate modellers, or as skilful chasers; and their handiworks in bronze, in gold, and silver are still treasured for us in museums and collections. But gradually the range of the artist became more limited; those who practised as painters or as sculptors ceased to follow the cognate arts; the artist ceased to be the art-workman. The manufacturer arose, and then, in most countries, the relations of art to industry were relegated to a separate, and, as it soon came to be considered, an inferior class of artists. Yet it must be noted that all great improvements in taste may still be traced to the follower of fine art stooping once more to ally himself with the manufacturer, rather than to those who had started as designers for manufacture advancing to greater taste and skill in their branch of the profession. Thus, in England, where, more than in any other country, the two branches of art had become most completely dis-united, it was to the genius of a Flaxman that we owe a distinct development of the potter's art; while to Stothard, perhaps in a less degree, we owe improved taste in our textile fabrics and greater propriety in the works of our silversmiths.

Royal manu-
factories and
their influ-
ence on
taste in
design,

and in pre-
paring
skilled work-
men,

Although this change of relation between the artist and the manufacturer had begun to arise in France, as in other countries, the dis severance between the two was early checked there by the wise policy of Colbert in founding the Royal manufactories of Sèvres and the Gobelins. It has been well said that Governments are bad manufacturers: a great truth as regards economy; but there are other phases of the question, by which these Royal establishments come to have an important bearing on the manufactures of the country; and it can hardly be doubted that the acknowledged superiority which Paris maintained for some generations in articles of

luxury and matters of taste, and the place it held, and still holds, as the source of fashion, has largely arisen from the taste of designers fostered and the skill and excellence of the art-workmen trained in these national workshops. There the best artists have ever been employed to produce, irrespective of cost, the finest specimens of art applied to manufacture, both in tapestries, hangings, and carpets; in porcelain and its applications; and in those highly-wrought pieces of ornamental furniture combining beauty of design, varied combinations of material, and the utmost efforts of the skilled workman; works which have stimulated the efforts of the native manufacturers, and which, in our day, are objects of study in our museums, where they vie in value and are prized equally with the choicest works of fine art. Another advantage arose from the employment of artists as designers for these Royal manufactories. Well paid, enjoying the prestige of Government engagements, and assured of the most perfect realisation of their inventions, their position was a very honourable one; from time to time private manufacturers sought their assistance, and thus the status of the designer generally was raised to the same level as that of the artist, and the two classes were not separated, as elsewhere. Royal manufactories for less extensive objects have been established in other continental cities; but in England, since the failure of the attempt made in the reign of Charles I., the State has never entered upon the culture of taste by itself becoming a manufacturer; although it is highly to the credit of our countrymen that by individual enterprise, unassisted by State bounties, they have been able oftentimes to compete successfully with the endowed establishments of other lands.

Added to the causes already stated why the artists of France have more readily allied themselves to industrial art than the English have, is that arising from the locality of their great manufactures. In England the great seats of those manufactures to which art is applied are far from the metropolis, in which our greatest artists reside, and to which they press from all provincial towns. Staffordshire and Worcestershire—a day's journey from London—are the seats of our pottery and porcelain works; Sheffield and Birmingham, of our hardware and plated goods; and for the largest portion of our current jewellery; Manchester, Coventry, Macclesfield, Paisley, &c., for our textile fabrics. There, no one following fine art will permanently reside; whatever advantages the manufacturer may offer to unite them to his interests, all press to the great art-centre. But Paris is not only the seat of art, but largely also the seat of

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.
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and on the
union of
artist and
skilled work-
men.

Paris the
seat of ma-
nufacture
and the resi-
dence of
artists.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

advantages
resulting
therefrom.

The study of
Fine Art in
the Royal
Academy of
London

art-manufacture. Besides the Gobelin, with its tapestries, its carpets, and its manufacture of furniture for the Imperial palaces, Sèvres is within half an hour's distance; while the furniture manufacturers of the Marais supply not only Paris but France and foreign countries; and the bronzist, the designers for goldsmith's work and jewellery, find their designs perfected in the immediate vicinity of their own ateliers. In England the intercourse between the studio and the manufactory is divided both by time and distance. In France the artist can see his own creations grow under the hand of the workman, can easily be consulted as to every change and difficulty, and finds the highest class of instructed workmen close at hand to aid in their realisation.

Hence we find such architects as M. Victor Baltard; such sculptors and modellers at Maillet, Klagmann, Mathurin Moreau, Gumery, and Thomas—high class medallists, holding honours in the French school—designing for the goldsmiths' work of Cristofle; such painters as Hamon, Flandrin, and Hebert, painting on the vases of Sèvres, &c., while in England such relations between artists of high repute and the manufacturer are not only rare, but still more rarely brought under public notice.

Other causes connecting those who cultivate the fine arts in France with those who more especially devote themselves to the decorative arts and as designers for manufacture, may be found in the rules of the Ecole des Beaux Arts. In England, at least until within the last few years, those who desired to become artists sought the preliminary knowledge necessary either in private schools, or by studying from the marbles in the British Museum, and then endeavoured to obtain admission to the Royal Academy. There the works of each candidate for admission are submitted to the council, and, if possessing sufficient merit, the youth is allowed a term of probation of three months. At the end of that time the works executed in the schools are submitted with those first presented to the council, and, if satisfactory, the candidate becomes a student for seven years, or otherwise he is remitted to his elementary studies for a further period of six or twelve months.

Once in the Academy, his time is almost exclusively given to the study of the human figure from the antique and from nature, and to painting and sculpture as fine arts. Admitted to these schools, the pupils consider themselves to take rank as artists, and since none can study there but those who have gone through the above-named long probationary trial with success, the students cultivate exclusiveness, and look down upon the outsiders who are not partakers of their own

advantages. A change, however, has taken place during the last 15 years. The advantages offered, and the excellent course of teaching, in the Government art schools have led many who intend eventually to become artists to frequent them for elementary instruction. Therein they obtain a degree of acquaintance with the best ornament of all periods, some knowledge of styles, and great readiness in drawing forms of ornament and foliage before entering upon the study of the figure. Thus many young artists rising into eminence and many students of the Royal Academy, are now well acquainted with ornamental design, and are using their talents simultaneously in the decorative and in the fine arts. But the schools of the Beaux Arts at Paris have always been far less exclusive than those of our Royal Academy—the admission of all who are desirous of studying art more free and unfettered than to our own. There the study of the figure can be attended, not only by those inscribed on the books, whether as students or aspirants for admission, but by any of those who are devoting themselves to the study of art. Every night between November 1 and April 30 two schools are open to all who have applied to the director for admission. At the commencement the students compete for places, and outside students admitted by the director can compete, not only for places, but for prizes, in the *trimestral concours* equally with those instructed in the studios of the professors appointed to ateliers in the Beaux Arts. It may be remarked that, though this admission only relates to the evening schools, and does not confer the privilege of studying in the special ateliers of the professors of painting or sculpture, it really admits to nearly the same amount of instruction that is afforded to students in Trafalgar-square, which largely consists of night study of the human figure, young artists soon giving up the day-time to labour in their own studios. It is well worthy of consideration whether, under the altered condition of our Academy and the increase of accommodation its new schools are to provide, some freer mode of admission to study in them might not be adopted. We should not then find deserted benches and empty places. The aspirants, as they are called in France, would be allowed to fill seats unoccupied by regularly admitted students; and thus, with no hindrance to any but the idlers, participate in the benefits of the instruction our schools afford. Another good regulation of the French schools is also worthy of adoption. There the figure from the antique is placed for a fortnight alternately with the living model, new places being arranged on every change. This results in a more rapid and less

compared
with the
course of
study in the
Beaux Arts
at Paris.

Comparison
of the art-
schools in
France
with those
in England

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.
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French
artists, de-
signers, and
art workmen
brought
into contact
in their
studies.

laborious mode of studying from the cast, while a more careful mode of working from the living model, and a more direct reference of the nude life to the antique is also obtained, and, at the same time, that irregular attendance obviated which arises in our schools of the antique from the figures remaining unchanged during a whole session, and the student, not regular in his attendance, being allowed to retain his place. But the real purpose in view in drawing this comparison between the two academies of fine art is to show how greatly the Parisian system tends to a union between the student of fine art and the ornamentist. Through it students in the various schools of design in Paris—both Governmental (as that in the near vicinity of the Ecole des Beaux Arts) as well as communal—can freely enter and study in the evenings side by side with those specially following the fine arts;—Paris, a city of much smaller area than London, offering little obstacle to their so doing. Thus the class distinctions prevalent in our own schools are avoided, and the youths feel it no loss of caste to work indifferently as ornamentists or artists, as remunerative occupation offers. This is aided by the course of instruction laid down for the architectural students at the Beaux Arts, which is really a complete course, while the instruction of architects in the London Academy is little more than nominal. In Paris great stress is laid on the young architect's power as an ornamental draughtsman and designer. There are in the architectural course, four competitions in each year in designing the figure and ornament; thus architects brought up in the ateliers of the professors of the Beaux Arts are highly accomplished in a branch of the art in which they so seldom qualify themselves in England, and learn to appreciate and take a deeper interest in all the arts cognate to architecture than has until lately been the case in England.

But besides the more intimate relations which have been fostered in France between the artist, the designer, and the manufacturer, and those to which we have just alluded, which arise out of the rules of their school of fine art, it must be remembered that for a century before such institutions existed in England, schools, both Government and municipal, have been open in Paris for the gratuitous instruction of the artisans, the designers, and the decorators. We have from time to time inspected the art-education afforded by such schools, both in Paris and in other continental cities, and from this inspection—from the careful examination of the works exhibited in Paris in 1863 (to which allusion has already been made), and from the draw-

Comparison
of the art-
teaching in
various
countries.

ings and models exhibited in the present international building by Italy, Wurtemberg, Bavaria, Austria, and England,—we shall endeavour to make a few remarks, not on individual works, but on the merits and defects of the varied teaching to be found in them. The visitor interested in such matters would do well to examine these works, some of which, not openly exhibited, are to be found in folios in the various countries. And, at the same time, it would be desirable that he should seek admission to some of the art schools in Paris and examine for himself the class of students who attend, the accommodation provided, the examples used in them, as well as the instruction they afford. He will find no difficulty in obtaining permission to see the Government school of art, in the Rue de l'Ecole de Médecine, or the communal schools in other quarters of Paris.

Course of instruction and modes of execution in French art schools.

In the French schools for art-workmen no special course seems to be laid down which the students are expected to follow. They commence with linear drawing, both with instruments and free hand, but in the latter case, the clear outline and precision exacted in the schools of art in England are not sought for, oftentimes a bolder manner—a kind of black-board practice—being the only elementary initiative. When the student proceeds to shading from flat examples or from casts the use of the stump in execution is far more prevalent than the point, and the same is observable when he arrives at the study of shading from the cast or from flowers and foliage, or ultimately practices shading the figure from the cast or from life. This tends to great freedom and ease of execution, if at some loss of correctness and truth; too often, also, the study from flowers and foliage is confined to copying the designer's rendering of Nature rather than any recurrence to Nature herself. By this the freedom and ease of the decorator are arrived at, though at the loss of novelty and of imitative truth. Our course of teaching seeks freedom through knowledge attained by careful and precise imitation, the French system rather seeks facility and fluency without such foundation. And this brings us to the examples used in the French schools, which are certainly not well selected, or such as we should so consider. The students are permitted to draw from modern lithographed "studies for ornament"—from coarse, picturesque costume heads and figures—rather than required to make careful studies from the antique—from flat copies first, and then from the round, the fine examples from the antique by Reverdin being less used than those by Julyan or others of like character. In these schools also there is far less drawing from actual plants and foliage than with us, and many of the flat examples set

Comparison of French and English examples.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.
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before the scholars, both of flowers and foliage, are such as have already undergone one stage of generalisation at the hands of the decorative artist, rather than exact imitative studies of nature, as with us, leading the student on to work with like care from nature itself, as a groundwork for his own future treatment of it. Again, although the construction of ornament and the production of new ornamental forms is taught in the Government, and partially in some of the communal schools, no instruction seems to be given in the historic styles of different periods, or in the principles which should guide the application of ornament in the decoration of separate fabrics and objects. The use in these schools of the ornament of to-day rather than of well-chosen examples has already been alluded to, and it arises largely out of the nature of the occupation of those who frequent them for study, men more or less skilled in the decorative arts, and constantly following them as their occupation. To them a knowledge of the prevailing fashion is all important, and any new publication by artists of repute, or any decorations in progress of execution from their designs, are eagerly sought as a direct source of present profit, and of more immediate value to the art-workman than those studies which, if valuable in the end by leading him to a fuller sense of the beautiful and the true, might do so at the expense of his attaining facility, readiness, and acquaintance with the fashion of to-day by which he lives. With us decoration is the exception rather than the rule; but in France the churches, palaces, private residences, and shops, abound with decoration, both painted and modelled, and the workmen who execute it acquire a facility and skill inducing them to spurn precise study; these often continue to frequent the schools, and their readiness has a charm for those who are their companions in study, leading them to consider facility the highest excellence, and disinclining them to that careful and thorough training pursued in our schools. Yet there is no doubt that the more precise instruction required by us would act as a corrective to the weak exuberance observable at times in French decorative art, without depriving it of the rare manipulative skill in which we are deficient, while an infusion of the French practice in our own course might be equally useful to ourselves, and correct the common tendency to coldness and apparent want of inspiration.

Art schools
in Wirtem-
berg.

The fullest exhibition of the works of pupils in art schools is made by Wirtemberg in Class 8. (No. 2. *Les écoles ouvrières communales de quarante-six localités du Royaume de Wirtemberg.*) The course does not essentially differ

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

Compared
with our
course.

from that of England. The student seems to be taught practical geometry, perspective, and mechanical drawing, of which there are good examples exhibited, the course of orthographic projection being very full. In freehand drawing the same clear and somewhat precise treatment of outline seems sought after as with us, and the early training of the hand and eye to correctness carefully attended to. The shading from the casts is, as in England, rather with the point than by the stump process. In our schools, in all the early stages the studies are alternated; first, outlining from flat examples, then from solids and objects; shading from flat examples next has place, then shading from models and casts of ornament; flowers and foliage are drawn from flat examples, then from nature; the figure in outline, or shaded first from flat examples, then from the round, and finally from the living model; so that through the whole course the student has, as soon as possible, the *thing itself* placed before him for study rather than a drawing from it given him to copy, just sufficient use being made of the flat example to give him power to proceed to the round. This interchange does not seem so fully carried out in the practice of any foreign schools. Nor do we trace in them the use of a well-selected set of examples. It would seem here, as in France, that the choice was somewhat capricious, and that at times the ornament of the day replaced for study those finer examples which should be derived from the best periods of antiquity or the Renaissance.

Bad ex-
amples for
study in
some foreign
schools.

We notice also that not only here, but in other German schools, examples of relief ornament are in use which appear to have been modelled expressly for study, and to that end have been made so sharp and precise, so cleanly cut from the ground, as to tend to great errors in their use. The student ought to be taught that relief ornament should not be like appliqué work, and that it is a great fault to lose that beautiful quality seen in all good ornament of occasionally melting the forms into the ground. This error arises among the modellers from working on a hard ground, as a slate or tile—a practice discontinued in our English schools at the instance of Sir R. Westmacott, who early perceived the stringency and hardness resulting from it. Perhaps the cold precision of much of the German ornament, its cast-iron respectability and mechanical look, so opposed to the happy facility of the French ornamentist, may in part arise from these faulty models. Among the works sent in by Wirtemberg we do not find many examples from foliage and flowers, and the life-studies are principally portrait heads, often clever and characteristic, if somewhat prosaic,

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

Schools in
towns of
very small
population.

and with too much attention to rendering into black and white the colour of the hair and dresses, although a better practice has been observed in those from Rottenberg. As far as may be learnt by the works exhibited, the object of the schools seems to be simply to form good draughtsmen and modellers, intelligent artizans skilled to handle the pencil and the modelling tool, and able thoroughly to comprehend working drawings, rather than to instruct designers for manufacture or to instil the principles of decorative art; for this purpose the instruction they provide is very suitable, while it is worthy of notice how widely this teaching is spread, and what small towns, or as we should call them villages, have their drawing schools. Thus from an examination of the notices of each school we find Sulz, with only 1,800 inhabitants, sending the works of its students, among which are some good studies of ornament painted in flat tints; Knittlingen with 2,500, Geisslingen with 3,000, Ellwangen with 3,500 inhabitants, and other places of about the like population, the works from which include well-executed shaded ornament, heads from the life, &c.; so that in these small towns the instruction given is not necessarily of a merely elementary character.

Each of the works exhibited is properly labelled with the name and age of the student, and the time each has been under instruction. The ages vary from sixteen to twenty years, and the time in the schools in some cases is four or five years. In these respects they differ little from our own. We are without information as to the amount of assistance afforded by the Government, and thus are unable to institute a comparison as to cost. In England, with Government aid and a fee required from each student, art-schools cannot maintain themselves in towns with a less population than from 6,000 to 7,000; although, where the population is less, a master sometimes takes charge of schools in two neighbouring towns, dividing his time equally between both places. But in Wirtemberg, where the instruction to the workmen is wholly gratuitous, places with a population hardly one-third of this maintain a school. Perhaps these are more of the character of our night schools, which, under a late minute of the Education Board, are now being established, taught by masters holding less advanced certificates of competency than those in art-schools. These will give an elementary knowledge of linear and free-hand drawing to the artizan; but the instruction given in the Wirtemberg schools seems of a higher character than, for a time at least, can be expected from the night schools here.

Art-schools
in Bavaria.

Bavaria exhibits a collection of works executed at the

Ecole Royale des Arts et Métiers at Nuremberg. They are very similar to those from Wirtemberg, but more advanced as those in our art-schools, and carried further in the direction of the figure; many fine drawings of the whole figure both from the antique and the life being among them, as well as some very bold drawings of half-length draped figures, florid in treatment, and picturesque as to chiaroscuro. The visitor will do well to examine them. The stump is used more than in our schools, but with a result less slovenly than in the French. The ornamental examples of modelling are more exclusively German than even in Wirtemberg, and modelling in both countries seems practised by a larger proportion of students than with us, while, as in other foreign schools, colour seems little attended to. There is the same apparent want of selection in the examples.

Austria shows only a few of the drawings of students in her art-schools; they do not greatly differ from those from our own, except in being more hard, respectable, and precise, from the reasons already referred to. There are one or two heads from antique busts hardly of average merit, and some models of ornament in red wax on a hard ground, fully bearing out the remarks we have already made—that this leads to a clean and hard treatment without much feeling, and without any union of the ornament with its ground. Several folios of drawings, the results of art-teaching in Venice and Lombardy, are to be found in the Italian Court. From the long connexion of these countries with Austria, the teaching is, of course, much the same as in the German schools. From Bergamo, where there is a school of one hundred pupils, there is a large number of architectural drawings, both of existing buildings and compositions, as well as details of construction, timber bridges, &c., which the visitor will do well to examine. Other schools show a good acquaintance with practical geometry, orthographic projection, and free-hand drawing. Of this latter class some well executed outlines are sent, although not always from good or well-chosen examples.

Art-schools
in Austria,

and in
North Italy.

It would have been of great interest if, instead of the heterogeneous collections sent from the various countries, a selection to show the course followed had been made in each, as has been done from England, so that comparison might have been made between them, and the mutual errors and advantages fairly considered. As it is, our inspection leads us to think that the course adopted in England is better than that of Germany, and can gain little from it, but that advantage might arise if, after the care and precision inculcated by the more elementary part of our course are attained, the

What we
may learn
from the
foreign
schools.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.
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students were directed to seek the greater facility afforded by parts of the French system of teaching. This would result from more attention being given to *time drawing*, a practice occasionally enforced in our schools, and which has then shown how fully the exact training of the student in the elementary part of our course has given readiness and power of rapid execution. In many of our provincial schools the member for the town, the municipal authorities, or resident manufacturers, besides the rewards offered by Government, give prizes to stimulate the industry of the students; perhaps some of these could not be better applied than by instituting stated competitions in modelling, drawing, and designing, wherein the students should be required, in the school, to compete in a given time, rapidity of execution being one of the conditions to be combined with excellence in the work produced.

Course of
instruction
in design not
general in
foreign
schools.

Although the composition of ornament is taught in Paris, both in the school in the Rue de l'Ecole de Medicine and in some others, one section of the English course is peculiar to our own—the section of “elementary design,” preparing the student for the practice of decorative design by the careful study of ancient ornament, by the analysis of foliage and flowers, with a view to the new ornamental forms to be derived from them; by the study of the geometrical and other laws which govern the agreeable distribution of ornamental details, either as to form, colour, quantity, or symmetrical combination; and, finally, as to the proper application of ornament to the various materials in which the design is intended to be wrought or executed. These laws of *fitness* in application are, to say the least, not followed by the decorative artists of Paris. The flat treatment of ornament on hangings, carpets, &c.; the conventional rather than the imitative rendering of flowers and foliage, the absence of shadows, and the true relation between the ornament and the ground on which it is wrought—all so well understood by the Orientals and by the artists of the Middle Ages—are ignored in the works of the modern French designers; the true distinction between pictorial and ornamental art quite overlooked. Thus landscapes, animals, and figure-subjects are found not only on hangings and carpets, but on the backs and seats of couches and chairs, while the woven and painted flowers on the dresses of the ladies vie with the artificial ones that adorn their head-dresses, or the natural flowers that compose their bouquets.

Instruction in schools of art in these fundamental principles is, perhaps, more necessary in Paris than with us, since it is most difficult to throw off the tastes, feelings, or prejudices,

MR.
REDGRAVE,
ON
APPLICA-
TIONS OF
DRAWING,
&c.
—

arising from education and the objects by which we have been surrounded from our youth upwards. Thus it must be almost an impossibility for the French student or artist, with his surroundings from infancy, his instruction in the schools, or his labours as an art-workman, to depart from the florid richness, the redundancy of line, colour, and ornament, which have characterised the decorative manufactures of France since the days of Louis XV. It will require a long period of teaching sounder principles, the continuous and careful selection of good objects for study, and the example of men distinguished in their profession to bring this about. Meanwhile, who can wonder that the French people and their guests from other countries are astonished and captivated by the sensuous redundancy of rich ornamentation, the flow of fancy, and the executive skill of their designers. It is difficult even for those who uphold truer principles so to qualify their admiration of beauties as not to appear cautious and cold in their estimate of the *propriety* of these designs. It is out of the range of our report to allude to the extreme skill with which flowers, fruits, figures, and animals are designed and wrought in the hangings, carpets, &c., of the Gobelins, and some of the great manufacturing firms of France—in the silks, and shawls, and paper-hangings exhibited—they will for their own sake be much examined by all visitors to the Exhibition; but it has been felt as a duty, before noticing some of the designs for such works in Class 8, and before calling on the visitors to inspect them, to show wherein we differ from the principles on which they are wrought, however much we may praise them for other excellences.

Want of
principles in
French de-
sign.

As illustrating the above remarks, let the visitor examine the floral decoration of the designs by J. G. Gattiker (Class 8, No. 86). Though these are in the imitative or picturesque style, it is impossible not to be pleased with the happy ease with which the groups of flowers are executively rendered, the skill and taste of their arrangement and distribution, the delicate gradations from colour to grey, and the manner in which each group recedes by neutral tints into the background. We may object to the gaudiness of the colouring and to the principle of ornamentation, but for the qualities we have named our decorators may well study them. A design containing three roses dispersed on a lilac ground is also one that should be examined. Other decorative designs in this Class (8) also deserve careful study; of their excellences, that we may learn from them; and of their faults that we may avoid them. These latter are crude colour and coarse and violent contrasts; while the perfect mastery of execution, the

Taste and
executive
skill in
French de-
signs.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

power of throwing parts of the group into different planes, and the delicacy of the tints are points from which much may be learnt. Take those of V. Guéritte (Class 8, No. 96), for instance, and examine the ease with which he throws his flowers on the surface of his paperhangings, or loops them as flounces for dresses forcing us to admire works we object to on principle. Again let the visitor inspect the delicate artistic execution of some of the small designs for portières and canopies exhibited by H. Henry (Class 8, No. 108). Take the design for a carpet (Fabrication Chenelle), and he will we think confess that his eye is delighted with its colour as of a bouquet, its tender contrast of tints, and the clever way in which the arrangement of the wreaths of flowers as points of colour sparkle and give expression to the design. It is a carpet in thoroughly French taste. Compare it with a design by the same artist, which hangs beside it, and which is called Chinese (though it might be better named Persian). How respectably tame! How sober it looks in comparison with the other! will be the exclamation; and though good taste may suggest that a carpet ought to be quiet, ought to be rich without contrasts of colour, ought to give a sense of flatness, can we wonder that the French purchaser laughs at such reasoning? She, perhaps, shows her salons rather than lives in them; they must be as gorgeous as her means will afford; everything must call attention to the wealth and opulence of the owner, from the floor, glowing with the richest imitative bouquets, to the ceiling with its azure on which sportive cherubs entwine wreaths of flowers. Can there be a doubt as to which carpet she would choose, and do not we even hesitate as to whether she is not right and we wrong? But let us pass from these designs, radiant with carmine, azure, and emerald green, to rest our eyes awhile on the fabrics in the India Court of the English department—not pseudo Oriental, half French and half Indian—Indian or Persian, perhaps, in mere line and general appearance, without the wondrous sense of harmony in tint and dye which we shall there find the Indian artists inherit as their birthright. There we see at once how gold and colour can be brought together; how through the most marvellous subtlety of colour and tint, the greatest sobriety can consist with the greatest richness—richness without a flavour of gaudiness; and, beyond all, how the decoration of each fabric is suited to its use and thoroughly subordinate thereto.

Comparison
with orien-
tal manu-
factures.

But, returning to the works of the French designers in Class 8, there are some to which attention may be called for higher qualities than those to which we have already alluded. Among them the designs of M. Prignot (Class 8, No. 194)

deserve careful examination, as exhibiting much that has been derived from the study of the past, joined to some of the best qualities of French decorative art. Thus his designs for inlaid borders have great delicacy, both of drawing and colour flatly treated, and evince a study of the cloisonné enamels of the Chinese. His more important designs for internal decoration combine the figure with ornamental forms very happily, and show fancy and richness with a subdued and well-regulated taste. They are the works of a true artist and appear to give evidence of the influence of English taste in subduing the over-exuberance of French design. The designs for interior decoration exhibited by M. Ouri (Class 8, No. 172) should also be examined as works of fancy and skilled invention.

There are some designs for lace which call for examination. In 1855 England was greatly dependent on foreign countries for lace designs; but since that period, and almost wholly through the operation of our art-schools this is entirely changed, and our designs are rather sought for abroad than imported by us. A glance at the lace exhibited throughout the Exhibition will show the great improvement in taste in this manufacture since the last Exhibition, both in England and, in a less degree, in other countries. Of designs for lace, England only sends one or two specimens as illustrations of the course of design adopted at South Kensington. They are the works of students, but will be found not wanting in taste or style. Belgium also displays a few lace designs; but, although the designer has received one or two Belgium medals, we cannot call attention to them for any merit as designs. In France, M. A. Roussel (Class 8, No. 215) exhibits some designs of great merit for lace handkerchiefs, in excellent taste and beautifully executed. The ornament of the boarder is so treated with thick and thin work as to have somewhat the delicacy of a cameo, and the ground is powdered with a diaper of carnations, alternating on every other lozenge with stars. One or two berthés and scarf ends are also ornamented on good principles and with much fancy. While in this locality the visitor may with advantage examine some of the products of M. E. Phillipe (Class 8, No. 186), who combines the designer with the art-workman, exhibiting among other things an enamelled and an ivory casket designed, modelled, and carved by himself. Russia is one of the few countries which exhibit designs. They are by pupils in the Ecole Straganoff (Class 8, No. 2), and show a curious struggle between the Byzantine traditions of art and the imported French Renaissance.

Designs for
lace, Eng-
lish and
foreign.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

Production
of school
examples.

Before concluding this report there is one subject to which reference has been made which requires more special attention. I allude to the preparation of examples, and the reproduction of works for the furtherance of education in art, illustrated by many objects contained in this class, and which has an important bearing on art-education. In all countries, examples of more or less excellence for the use of art-schools have been prepared. In our own, the series of lessons in outline ornament, by the late Mr. Dyce, was undertaken by direction of the Committee of Management of Schools of Art. It has superseded those of Albertolli, Weitbrecht, &c., and still forms the commencement of the pupils studies. Other excellent examples for shading and figure-drawing have, from time to time, been prepared under the sanction of the Department, and casts from the best ornaments of the past obtained for the use of the more advanced students. The choice of such works, as we have shown in the case of the German casts, is of great importance; their use may tend to sow the seeds of good or bad taste at the very commencement of the student's career—their adoption in a public course of instruction adding greatly to their authority. A curious instance of the necessity of carefully selecting such examples, and of the readiness with which they are adopted abroad, is seen in the collection of students' works from Wirtemberg. There two copies from casts of objects at South Kensington are in use. These casts were made, about three years ago, for the Society of Arts to test the skill of the operative carvers in wood or stone, and were fairly well adapted for that purpose; far less so as lithographed plates to be used as drawing copies in the schools.

But, beside the production of works to be used as a course of elementary study for training the hand and eye, the culture of the taste and of sound principles of art have to be promoted by placing before the decorative artist the finest works of past ages wherein handicraft skill has realised beautiful design. For this end all countries have gradually awakened to the necessity of founding museums and collections of rare and beautiful objects, and sought their dissemination by various means, to permit of their more extended use and reference.

To achieve the first of these objects our Government, after the International Exhibition of 1851, founded the Department of Art, and laid the commencement of the South Kensington Museum, an establishment better known and appreciated on the continent than, at present, even in our own country. As localities began to understand the value of art schools and museums, and their importance towards the

improvement of our manufactures, and as choice works of art, necessarily rare, got more and more locked up in public museums, a system of circulation was adopted, and efforts initiated for reproducing, by all available means, fine works of ornamental art, both to complete the central museum and to provide by local museums for the instruction of the artizan and the public. Fortunately the advance of science had almost simultaneously provided means to aid this movement by the invention of the electrotype process, by photography, by chromolithography, gelatine and gutta-percha moulding, &c. ; and it soon became apparent that not only might our own central and local museums be so aided, but that an interchange of the rare treasures of other countries might be thus promoted in the best interests of art and the art-workmen in all.

After the International Exhibition of 1855 the Emperor of the French, in the most liberal manner, responded to a request on the part of the English Government to allow the most valuable jewels, crystals, enamels, &c. in the Louvre to be photographed, and he placed at our disposal the means of carefully colouring these photographs after the originals. On a subsequent occasion he added permission to mould for electrotyping the finest pieces of armour in the Musée d'Artillerie, and allowed repetitions to be made from the casts prepared for France from the Trajan column. Other countries have also permitted these reproductions, and casts from various objects in Italy, Spain, Saxony, &c. have been added to the collections at South Kensington. From these reproductions of various kinds, and by the several means enumerated, a selection has been made to exhibit in the British section at Paris, and in Class 8, No. 15, will be found plaster casts from the pulpits of Giovanni and Nicolo Pisano, of part of the door of the cathedral of Santiago de Compostella, in Spain; electrotypes from the gates of the cathedral of Pisa, from the bases of the standards on the Piazza at Venice, &c. ; electrotypes of the armour in the Musée d'Artillerie, of many of the rare objects in the Louvre, at Paris; of the coronation plate in the Tower, and of rare objects in the South Kensington Museum; and coloured imitative drawings, photographs, etchings, and chromolithographs of the most choice works at home and abroad. This collection ought to excite the attention, both of our countrymen and foreigners—to be useful in obtaining permission from foreign countries to increase it; and it is hoped will be the means of promoting a system for the reciprocal interchange of such works.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING
&c.

Circulation
of works
from South
Kensington.

Reproduc-
tion of ex-
amples.

MR.
REDGRAVE
ON
APPLICA-
TIONS OF
DRAWING,
&c.

—
Extension of
the principle
of supple-
mentary ex-
hibitions by
such means.

Other countries have made some beginnings in this direction. In addition to the splendid work on the antiquities of the Russian empire, a series of careful copies from antiquities at Moscow, now in preparation for publication, should be examined; they will be found in the Gallery of the History of Labour, and in another section some reproductions of goldsmiths' work. Spain also exhibits (in Class 6, No. 1) a fine work, preparing under the sanction of the Government, of the architectural monuments of Spain. France, which is so much more prolific than other countries of fine illustrated works on art produced through the usual channels of trade, is publishing, with Government sanction, "*Archives des Monuments Historiques*," &c. Austria exhibits a small case of reproductions by Haas, and also photographs and plaster casts from objects in the Royal and Imperial Museum. Thus there are indications to show that the movement is progressing, and we may hope that shortly a system of interchanges will be set on foot by which our own and all other collections for increasing taste in and feeling for good art will be rendered more complete, and spread into manufacturing localities where, from the necessary rarity of fine objects, such art could not be otherwise seen and studied.

REPORT on PHOTOGRAPHIC PROOFS and APPARATUS.—
(Class 9.)—By HUGH W. DIAMOND, Esq., M.D., F.S.A.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

It has been found convenient to divide the report of this class into two portions, inasmuch as it comprises not only photographs in all their various forms, but also the lenses, the apparatus, the many mechanical appliances, and different processes by which they are produced.

The remarks made by the writer of this section will therefore be confined solely to the processes used, the apparatus employed, and the general application of photography, apart from its pretensions as a fine art, which division will be treated by another hand.

Few persons observing the objects exhibited by various countries in this class will have any idea by what gradual development the art has attained its present exalted position, not only as an art, but as an extensive and important source of commercial industry. The importance attached to the various inventions and discoveries which are indebted to photography for their origin will be appreciated from the fact that up to the year 1860 upwards of 200 patents bearing upon the production of a finished photograph have been secured in England alone.

Numerous
patents.

Although many of these patents are of a very trivial character, others are of much importance. Some of the greatest discoveries have been freely communicated by their authors, with the utmost liberality, without resorting to the protection of patent rights. To the honour of the inventor of the collodion process, it can never be too frequently placed on record that Mr. Frederick Scott Archer published, in March, 1851, the collodion process, free from all restrictions, without securing any benefit to himself, and presented the world with a mode of producing photographs which may be said to represent, or be the basis of, almost the entire pictures in the present Exhibition—a process so far perfected by him that no author of any subsequent improvement arises in the mind to detract from Mr. Archer's first and original discovery. Though Mr. Archer gave this beautiful process, in its very perfect state, to the public in 1851, it must not be supposed that he had arrived at its good results without great research and numberless experiments, for it can be verified beyond all doubt that in November, 1847, he was

Invention by
Mr. Archer
of collodion
process.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

taking calotype pictures, and applying substances in the camera in the open air to improve the surface of paper. By slow gradations these early experiments culminated in the process given to his friends in 1850, and published in the *Chemist* in 1851.

Dallmeyer's
lenses.

Every one connected with the science and art of photography will lament to find but little advancement since our last great Exhibition of 1862. The optical improvements of Dallmeyer and others, the general applicability of the carbon processes, and the collodio-chloride process of Mr. Wharton Simpson will, with the advance which has been made in photographic engraving, claim honourable exception, and constitute the prominent feature in the Champ de Mars, so far as this class is concerned. Such being the case, the first consideration will be that of—

LENSES.

Since the Exhibition of 1862 great novelties and improvements have taken place in photographic lenses, the results of which are visible in the beautiful photographs exhibited in the various departments, and which, in many instances, would have been impossible to obtain with the old form of lenses. In that Exhibition the chief improvement exhibited was a triple combination, for which a medal was awarded to Dallmeyer, this being the first practically useful lens with which to photograph buildings, copy maps, prints, &c., free from distortion, embracing angles of from 60 to 70 degs.

General
improvement in
lenses.

Since that time other lenses have been introduced giving angles of upwards of 90 degs., and amongst these may be mentioned in the order of dates of introduction, the globe lens by Harrison, of America; the doublet by Ross; a wide angle single combination meniscus, composed of three cemented lenses, by Dallmeyer; the periscope, by Steinhill; the pantascope, by Busch; and, last, the rectilinear wide angle view lens by Dallmeyer. These lenses are intended for views and copying. As regards the improvements introduced in lenses for portraiture, advances have been made in enabling the photographer to produce more artistic results.

A lens has been introduced, a new form of combination, by Dallmeyer, which, whilst it possesses the advantages in respect to rapidity and definition of the old form of portrait lenses, can at the will of the operator, by the simple turn of a screw, be made to avoid extreme definition or hardness over one plane and to distribute it over several

planes. The specimens exhibited produced by this lens seem to demonstrate that a new power is placed in the hands of the artist.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

In the English department Dallmeyer exhibits specimens of the lenses above referred to, as well as those of the older construction. After carefully testing these several lenses—a duty in which the jurors were assisted by several experts, sanctioned by the Imperial Commission—a silver medal was unanimously given to Dallmeyer. From the excellence of the workmanship of cameras to which Mr. Dallmeyer's lenses were applied, his medal was awarded for apparatus as well as lenses.

England.

The lenses of Ross—consisting of his new doublet, the triplet, portrait and other lenses—were also examined, and a bronze medal thereon awarded to him. In consequence, however, of the decision of the Imperial Commission, it is to be regretted that these exhibitors are deprived of these awards, each having obtained a gold medal for optical productions in another class.

In the French department will be found a multiplicity of lenses by many manufacturers, some claiming especial advantages over others. The lens of one maker may be alluded to as stated to be adapted for all purposes, a degree of perfection thus being claimed which simply appears to be impossible.

France.

In a brief report, more than a recognition of the generally acknowledged excellence of the lenses by Voigtländer will scarcely be deemed needful.

In Prussia, Busch makes a large display of various forms of lenses. The jurors, finding the exhibit of Busch to be of excellent quality, awarded him a silver medal.

Prussia.

The megascope and other optical contrivances of Carlo Ponti exhibited in Italy are amusing and instructive. Since the Exhibition of 1862, partly from the increased facilities for manufacture as well as in increased competition, opticians have supplied some of their finest productions at a much less rate of cost than formerly.

Italy.

PERMANENT PRINTING.

The stability of the photographic print has always been looked upon as a matter of the utmost importance by the conscientious photographer; but, unfortunately, there is reason to fear this desideratum has not yet been thoroughly obtained by the method of silver printing hitherto employed. The well-known permanence of carbon as a pigment has led to the practice and publication of many methods of procedure

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.
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in which this substance forms the image—often varying but in trivial details, and yet each process seems more or less to have certain good qualifications to recommend it for practical use. Any attempt to describe in detail all these various modes of manufacture would more than consume the bulk of this report—attention can only, therefore, be directed to the more remarkable.

Swan's car-
bon process.

The one which seems to have achieved the most perfect results is that of Swan, of Newcastle-on-Tyne. An inspection of the exhibit made by him will convince the observer how beautiful the results are which he obtains, together with the variety of purposes to which it may be applied.

Other car-
bon pic-
tures.

Pouncey exhibits, in the English department, some specimens produced in printers', or greasy, ink. They seem to be protected on their surface with a sort of varnish. Visitors, by a comparison of these works with those of others, will find that much still remains to be accomplished before this process can produce results as satisfactory as those of many other exhibitors in the class. The jurors awarded Mr. Swan a silver medal.

In the French department will be found a series of carbon prints, admirably arranged in juxtaposition for comparison and observation; but those of Poitevin must attract the chief attention. Poitevin has lately received the award of 8,000f. offered some years since by the Duc de Luynes for the most satisfactory method of producing permanent photographic proofs. Readers wishing for more detailed information on this important subject will find a full translation of the official report of M. Duvanne in the *Journal of the Photographic Society of London* for the present year.

Photo-
relievo pro-
cess of
Woodbury.

The panoramic pictures in carbon of Bräun, of Dornach, who has purchased the patent rights of Swan for France, are especially worthy of notice, as well for their size as illustrating the satisfactory acting of a camera, to which reference will be found below. In the English department specimens of a process which may be classed with carbon are exhibited by Woodbury. Swan also exhibits an allied process, which he terms photo-mezzo tint. These methods consist in the production of a gelatine relief obtained by the well-known action, discovered by Mr. Mungo Ponton, in May, 1839, of a bichromate in conjunction with gelatine, under the influence of light, with this exception, the process being mechanical, and the image produced without the action of light. The following description of it is given:—

Mungo Pon-
ton's early
discovery.

“The production of a gelatine relief by exposing a thin film of gelatine and a bichromatic to light under a negative,

and then washing away the parts not rendered insoluble by the action of light, was discovered, in 1854, by Paul Bretoch; and most of the engraving processes since introduced have been based on this—or, to go further back, to the engraving process of Mr. Fox Talbot. Until now it has been impossible to render faithfully, by any mechanical process, the merging tints of black into white, as in a photograph; every photo-engraving or photolithographic process being a better or worse imitation of this effect. In the photo-relief process, owing to a new principle being introduced—that of using different thicknesses of colouring matter—this effect is now gained, and the results have all the appearance of photographic prints. When the gelatine relief is washed and dried it is placed in contact with a piece of sheet metal, between two perfectly true planes, and subjected to heavy pressure, which causes the metal to take a sharp impression from the relief. A metal mould is now obtained ready for printing.

“In the first part of the process a mould is obtained which, on examination by transmitted light, has all the appearance of a photograph, and which is in reality a carbon print without the paper. By taking a reverse from this in metal a mould is obtained from which, by again reversing the process of moulding, we have what we started with—namely, a mould in gelatine, which, by the addition of colour, becomes again like the first mould produced by the action of light, but with the advantage that no light is necessary to produce it; and, as a solution of gelatine soon sets, these pictures are produced at the rate of two or three a minute. The principle is not confined to the use of gelatine, but any material that can be moulded into a shape may be used to form these pictures, provided it be of a semi-transparent nature.”

These details of Woodbury's process will be sufficient to indicate the mode in which the similar pictures by Swan are produced, it appearing in many respects that Swan is entitled to a precedence. A silver medal was awarded to Woodbury.

The carbon prints exhibited by N. K. Cherrill, to whom a bronze medal was awarded, prove with what certainty and satisfaction the process by Swan may be worked. Van Lint, of Pisa, also exhibits additional satisfactory working of this process. As a general rule the carbon productions are more or less the adoption and working out of modifications of the processes described or suggested by M. Poitevin.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

Photo-
lithographs.
&c.

PHOTOLITHOGRAPHS, ETC.

Closely allied to the above processes are the photolithographs which prevail, under a greater or a less favourable aspect, in this class, in nearly every country which has contributed to the Exhibition. The best specimens are those of Lemercier, in the French department, and Simonan and Toovey, in the Belgian, although the works of no exhibitor should be passed over without a careful examination. De la Follie exhibits specimens of a very satisfactory character, which he describes as done by his own process, "Folliegraphique," at the cheap rate of from six to nine francs per hundred. The carbon photographs of Garnier are also highly satisfactory; so much so that, in conjunction with his specimens of photographic engraving on glass, his enamels, and other objects here exhibited, the jurors unanimously recommended that he should receive a gold medal, another gold medal being awarded to Tessie-du-Motary for a similar exhibition in connexion with the splendid specimens of photography applied to the decoration of glass suitable for windows and many other purposes. The chief works of the last-named exhibitor will be found in the pavilion especially erected for their reception in the park.

The Heliotype Company, of the United States, display reproductions of *Punch* and various cheap periodicals, executed by photography, having good definition and clearness.

The display in the English department of photozincography is very excellent. This is practised by the Ordnance Survey, under the direction of Colonel Sir Henry James, C.B., by whose adoption of and perseverance in the use of photozincography a very large sum has been saved to the country in the perfect reduction of the various official publications.

ENAMELS, ETC.

Photogra-
phic ena-
mels.

In the present Exhibition photographic enamels are more plentifully exhibited and are of a more beautiful quality than of any former occasion. There is one exhibitor only in England, Joubert, who has been awarded a bronze medal for his agreeable success in the practice of this branch of the art. In France there are several artists who excel in "photographie vitrifiée sur émail." Those of Lafon de Camarsac, to whom a gold medal has been awarded, appear to be the most perfect, varied, and elegant. It is a subject of regret that the precise formula used by this artist has

never been made known to the photographic community. Deroche, in France, and Deroche and Meyond, of Milan, have a series of enamels, evidently executed by a different mode, inasmuch as they have greater softness of character and a greater freedom in their treatment.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &c

Allied to photographic enamel, and in many respects quite as important, is the decoration of porcelain and glass by photographic aid. This appears to be a branch of industry which is rapidly rising in public estimation. One manufacturer alone in Prussia, Grüne (silver medal), is stated to have already manufactured and sold upwards of thirty thousand specimens. Not only are family portraits transferred to ceramic ware, but photographs are represented in various vitreous colours. A process having the appearance of enamel is exhibited in the English department by Powell. In this case the photograph is introduced under the surface of the glass, made perfectly adherent to it, and then hermetically sealed. The vases decorated by this process no doubt retain the photograph in a state of permanency, and from their cheapness and elegance are in much request for purposes of domestic ornamentation.

Photo-
graphs on
glass and
porcelain.

There does not appear to be a more valuable application of photography than that of Poitevin for the adornment of ceramic ware or terra-cotta bricks and tiles. A specimen exhibited by this artist is an impression obtained in colour, and designated "lithophaine," dated 1854. By some this date has been objected to, but it is certain that in December 1855 he states, "My moulds are adapted for printing and embossing, also for moulds for earthenware, &c." Another process, which he terms "photoplastie," by which medals are represented in reverse, heads and legends reading backwards, dated 1863, appears a process from which desirable commercial benefits might be obtained. The exhibit of Poitevin deserves especial attention, but those who will remember an impression of a picture exhibited by him in 1862, and now again brought before the public, may be induced to question if that guaranteed permanence really exists which has been claimed for some of these and allied processes.

Poitevin's
application
to terra-
cotta.

Photographic engraving appears to have made no advance in England. The curious specimens of Fox Talbot, exhibited in this country more than once, testify how little success has emanated from that which appeared so promising a beginning; on the contrary, many artists in the French department prove with what success under various names they have practised similar modes of procedure.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C
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Photogalva-
nography.

Dallas exhibits in the English department some photogalvanographic pictures, which some few years ago were described as full of promise. These pictures must be compared with others of similar production, and especially with those of Pretsch (bronze medal), exhibited in the Austrian section, with which they are allied, and from which they seem to differ little.

DRY COLLODION PROCESSES.

Dry pro-
cesses.

It has already been remarked that nearly all photographic pictures as at present produced owe their origin to the introduction of collodion, but almost from its first use by Archer those who have practised the art have endeavoured to get rid of the labour and difficulties of transferring to different localities the necessary chemicals in a fluid state, consequently numerous dry processes have been recommended and practised with more or less success; some of them having been so strongly advocated, with almost an amount of feeling, that operators not having time and resources for experimenting on their relative merits have failed to try any of them. It is very satisfactory to have the beautiful pictures of Mr. Mudd (to whom a silver medal has been awarded) to look at and admire; they stand out so pre-eminently before the results of all other dry processes that too much praise cannot be bestowed on the practice which Mr. Mudd uses. He has also the merit of freely publishing this process, the collodio-albumen, which, having its origin in France with M. Taupenot, has been so carefully investigated and pursued by Mr. Mudd as to leave but little to be desired. Even in dry plates of any magnitude the weight of the glass is considerable, consequently in many instances the use of paper for negatives is very desirable; so much so, that M. Le Gray has stated his abandonment of the use of collodion, and says, "It is my belief that the future success of photography rests entirely on the paper process." The large views in Egypt exhibited in the French section by H. Cammas are good illustrations of the value of Le Gray's process.

Calotype.

Dr. Diamond exhibits some pictures taken from negatives produced by a modification of the formulæ of Mr. Fox Talbot, a process which was in general use and known in France as "Procédé Anglais." When the extreme simplicity and portability which this process claims are considered, there is little doubt but that it will again be restored to its former popularity. The exhibitor states his

having worked consecutively for many years without experiencing any failure of satisfactory results.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

A small picture in the English department is exhibited by the Rev. J. B. Reade, F.R.S., developed by gallic acid, according to the mode used by him in the infancy of photographic research. Such pictures seem to have the advantage of greater permanence than others ordinarily produced by the silver processes. It cannot be affirmed that any instance is known of negatives by this process having become deteriorated by age.

Gallic acid
develop-
ment.

PHOTOSCULPTURE.

This curious application of photography will be witnessed with interest at the building erected in the park for its operation. It is under the direction of M. Willame, and appears to have everything in its favour for more mature development. A specimen is also exhibited by Mr. Claudet in the French department. This is by his own process, and seems to excel many of these productions.

Photosculp-
ture.

MICROSCOPIC PHOTOGRAPHY.

One of the earliest applications of photography, after the publication of Archer's collodion process, was that of using the microscope in connexion with the camera. In England many successful workers have appeared, especially Dr. Maddox, whose productions are exhibited by James How on the present occasion. The works of M. Lackerbauer, in the French, and Dr. Neyt in the Belgian, have received the unanimous approval of the jurors, and silver medals have been respectively awarded. It is to be lamented that Dr. Maddox withheld his name from his exhibit, as the Photographic Society of London had lately awarded to him their medal for his admirable productions.

Microscopic
photo-
graphy.

Beauty of
the pictures
of Dr.
Maddox.

ENLARGEMENTS.

The Rev. J. B. Reade very early produced an enormous representation of a flea by the aid of the solar microscope and his sensitive paper, but it has not been until within the last few years that there has been any public demand for enlarged photographs. Persons possessing carte-de-visite and other small representations naturally have sought to give them a more appreciable existence; this has led to the invention of admirable instruments for the purpose, and many of the best renown have devoted their attention to this class of work. The representations by Mr. Mayall, in

Enlarge-
ments.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

England, in a graduated series, are especially interesting, and have been rewarded by a medal.

Minute pho-
tographs.

Dr. Van Monckhover, in the Belgian department, exhibits his admirably arranged apparatus for the enlargement of pictures. There are also other exhibits for the same purpose, but which appear to be less carefully constructed.

Crystal
cube.

The little photographs, mounted as objects of bijouterie, and exhibited by Dagron and Co., in France, form an amusing series, and contrast with the enlargements.

Henry Swan, of London, exhibits a new optical invention for binocular relief in miniatures, which he calls crystal cube, or casket portraits. The object represented has all the relief as if viewed in the ordinary stereoscope.

APPARATUS.

General
improve-
ments in
apparatus.

Great improvements have taken place within the last few years in the design and manufacture of cameras, especially in respect to their portability and lightness; whilst the tripods for outdoor work and fixed stands for the glass room have become more firm and solid, consequently giving a greater stability to the artist's operations. In the English department the cameras of Meagher (bronze medal) deserve especial examination, as well for the perfection of their workmanship as for their perfect adaptation to the purposes for which they are designed; in fact, wherever a camera is exhibited, especially in the English department, it bears the test of scrutiny for its good and stable work. Some of the numerous stands in the French department are fitted with various novelties for accurate adjustment and facility of adaptation.

Panoramic
camera of
Mr. John-
son.

The greatest novelty in cameras is no doubt that of J. R. Johnson, designed for panoramic pictures. In this, which he calls the pantascopic camera, he appears to have succeeded in bringing into practical use an instrument for panoramic purposes. In the French department a camera is exhibited purporting to be for the same purpose. This was made by Martens, and presented by M. Arago in 1845 to the Academy of Sciences; also an improved one, presented by Baron A. Seguier to the French Institute in 1856. Whatever may be the merits of these last-mentioned cameras, it appears that the only pictures worth examining are those produced by Johnson's instrument.

Tents.

The United Kingdom makes a satisfactory display of tents, and similar appliances for working in the field. The tent of R. W. Thomas has met with general commendation. Those exhibited by How and Rouch are also of good design, and

well calculated for the purposes for which they are made. The portability of the smaller tent, by Rouch, must be of great advantage.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &c.

In the French department Dubroni (bronze medal) exhibits a very ingenious apparatus, which, the body of the camera being formed of non-actinic glass, permits all the operations to be carried on in open daylight or any ordinary room, elastic india-rubber bottles acting for the removal and replacement of the different chemicals required. The demonstration of the working of this apparatus before the jurors in the building was entirely successful. In the same section were also other cameras, by different makers, intended for the same purpose.

Portable
apparatus.

Oscar Kramer, of Austria, exposes a complete apparatus for photographic amateurs. It contains all the materials needful for producing small negatives, and afterwards printing them on paper. It has not only a camera, stand, and double combination lens, but also chemicals, bottles, dishes, &c., the entire packing in a neat box, the whole cost being 77f.

Cheap
Austrian.

The public taste for stereoscopic views has in a great measure passed away, but still there is a very considerable demand, and there is little probability but that they will always remain objects of attraction in most families. In the French department several stereoscopic stands and appliances will be seen of attractive appearance. In the French colony of Algeria an arrangement is made for the gradual rotation in such a machine of the most attractive views of that country.

Stereoscopic
views.

Although glass baths are generally to be commended for photographic uses, of which there are many specimens exhibited, especially in the Prussian department, yet it must be a great advantage to photographers to have lightness of material combined with absence of fragility in the various accessories, washing dishes, &c. Admirable specimens of these will be found in the exhibit of Dufournet and Co., France, called Carton-durci, as well as those in the Austrian department exhibited by Ignace Schrecker, of Pesth; some of these are of very large size. It appears that this material has also the advantage of cheapness.

Baths, &c.
not made of
glass.

Laurent and Co., of Paris, have a display of useful appliances, to which especial attention may be directed, of vignetting glasses, in which the shadow is adapted for various and irregular forms of pictures.

Vignetting
glasses.

A machine for cutting ovals, exhibited in the French department, appears to be a desirable adjunct to the working photographer.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &C.

Touching
glass nega-
tives.

The touching of glass negatives by the hand of the artist, by which, in many instances, improvements are effected, although it must be allowed that such practices frequently detract from the truthfulness of the photograph, has led to the introduction of apparatus for holding the negative in a convenient position for the transmission of light. Specimens of these contrivances are exhibited in the French department.

Presses.

In the English department Austin produces presses of great excellence of workmanship combined with cheapness, and fully maintains that excellence for which he was rewarded in 1862. In Austria Kramer exhibits a press which appears to have much facility of usefulness, having movable clamps or screws by which its position may be readily moved and attached to any bench or table.

Papers.

Since the last Exhibition there does not appear to have been any material improvement in the manufacture of the various papers employed for photographic proofs. Beyrich, in Prussia, has many specimens of photographs taken on the papers prepared by different chemical methods, thus enabling a judgment in some degree to be formed of their quality, which is in general very satisfactory.

Chemicals.

The exhibits of photographic chemicals are of great beauty, and have commanded much praise from Dr. Hoffman, who was appointed by the Imperial Commission to assist the jurors in this department. The manufacturers of that very essential material, collodion, in England—Blanchard, Mawson and Swan, Rouch and Thomas—have maintained the well-merited reputation which they have hitherto enjoyed.

Varnish.

A new varnish for negatives has been introduced by Newman, and is exhibited in more than one case of the British exhibitors. It is well calculated from its brilliancy, hardness, and freedom from liability to scratch, for general use, especially when a number of impressions are desired.

APPLICATIONS.

Applica-
tions nume-
rous.

The applications of photography are so numerous that they can only briefly be referred to. It is wonderful, throughout the whole Exhibition, to what numerous occasions and variety of purposes photography has been applied.

Astronomy.

No specimens of the wonderful astronomical photographs of Mr. Warren de la Rue occur in the present gathering, and there is a general absence of the important application of photography to astronomical science. Rutherford, of

New York, has an enlarged photograph of a portion of the moon, 23 in. in diameter, taken from a negative made by him with a refracting telescope, $11\frac{1}{4}$ in. aperture and 14 ft. focus, constructed and corrected by him with reference to photographic rays. He also exhibits a photograph of the solar spectrum 42 in. in length, with a scale of figures corresponding with those of Kirchhoff's chart. In Canada may be seen a small but interesting specimen of the application of photography to the representation of polarized light.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &c.
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In the Italian department are some valuable applications of the art to the delineation of osteological and other specimens. In the French department the action of artificial glass eyes is illustrated.

Anatomy
and oste-
ology.

A record of ancient oriental architecture is profusely rendered in the History of Labour, in the British department, by Colonel Biggs, as well as by Bourne and Shepherd; and the ancient marbles in the Indian Museum, the early Hindoo, Mohammedan, and other temples are reproduced with a faithfulness unapproachable by any other art. In the Russian History of Labour are a series of photographs illustrating antiquities in the monastery of Troïtsky Lavra, near Moscow, executed by the monks. In Switzerland are excellent examples illustrating the early remains of the stone, bronze, and lake periods. The tombs and temples of ancient Egypt and Nubia are faithfully recorded by Baron H. Cammas, exhibited in France.

Architec-
ture, &c.

The attractive subject of mediæval architecture in England is well represented. Thurston Thompson, by his exhibit in Portugal as well as England, shows the extreme value of photographic representations in illustration of ancient objects of art-workmanship, as well as the interesting architectural remains of localities in which he has recently employed his skill.

Thompson's
views in
Portugal.

The top of a table, from Melbourne, entirely covered with views of public buildings in that town, as well as the representations of the streets of Adelaide, in Australia, bring the present flourishing appearance of our colonies before the view. In Malta, an opinion of the fortifications and military architecture may be formed from the views displayed.

BOTANY AND NATURAL HISTORY.

Illustrations of natural history—and, in fact, of almost the entire aspects of a country—may be displayed by photography. In Algeria especially this is the case, illustrations of everything interesting or useful being exhibited.

Natural
history, &c.

DR.
DIAMOND
ON PHOTO-
GRAPHS, &c.

In Brazil, rows of palm-trees are represented. In Trinidad, the specific botanical character of plants may be judged with ease; in Canada, the forest trees; in Nova Scotia, the geology and fossils; in England, the animals in the Zoological Gardens, by Haes, as well as many other instances too frequent to record.

DOMESTIC AND OTHER APPLIANCES.

Various ap-
plications of
photo-
graphy.

Since the great English Exhibition the application of photography to book illustration, as well as its application to many purposes of domestic use, has largely increased. Instances of the latter may be seen in the photographs, by Ayling, of the Esterhazy jewels, taken previous to their late sale by auction; the scenes of the late war in Bohemia; the application of photography by the Marquis de Beranger, in France, to the decoration of fans and various objects of elegant use; the different patterns of lacework and ladies' robes; the general delineation of costume in every country, and bouquets of natural and artificial flowers. In book-illustration France displays many specimens; amongst which may be noted Paul Champion's journey to China; the country around St. Germain's, by Ildefonse Rosset; the scientific expedition to Mexico; as well as illustrations of a French château, in which every room, with its objects of art, furniture, &c., is represented. In Russia a large volume is illustrated by representations of the horses of the country; and in Austria is a volume of ornithology. In the French department is exhibited a series of views of the improved mode of culture and training of fruit trees.

The newly-discovered metal, magnesium, by the brilliancy and whiteness of its combustion resembling sunlight, has enabled photographers to secure pictures in vaults and other places inaccessible to ordinary light. It has also been made to supply the place of the sun itself in the solar microscope, or enlarging apparatus constructed on the same principle. In order to ensure its steady combustion, lamps have been contrived to secure the gradual supply of a ribbon or wire of the metal. Mr. Solomon, in England, exhibits a very convenient apparatus. The trial before the jurors was perfect. In Austria is a smaller but similar lamp for the same purpose.

In France an apparatus is fitted with an electrical means of opening and closing the lens instantaneously. Rouch and Meagher, in England, exhibit instantaneous shutters, which give much more facility of use. Rouch, in England, has an ingenious shutter for instantaneous pictures.

For several years photography has been applied in this country to the preservation of the portraits of criminals, and in many instances very important results have ensued from its adoption. The authorities of the India Museum display a very remarkable series of Indian criminals. This department also shows the valuable ethnological uses of the art in the representation of the people of India.

DR.
DIAMOND
OF PHOTO-
GRAPHS, &C.
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A further examination of the class and enumeration of the infinite variety of purposes to which photography is applied would exceed the allotted limits of this report, in which it is presumed sufficient indication has been made of whatever novelties may be now exhibited, and it will at the same time form a sufficient guide for those desiring to more minutely study the objects in detail.

REPORT on PHOTOGRAPHY.—(Class 9.)—By C. THURSTON
THOMPSON, Esq.MR.
THOMPSON
ON PHOTO-
GRAPHY.

IF we may judge from the number of pictures exhibited, photography must be approaching the full tide of its popularity. Never before were so many good works collected from all parts of the world; and in whatever country they are produced the temperature of the climate would seem to be of little consequence, as the photographer after a time appears able to overcome all difficulties that may arise from excessive heat or cold, and to produce works either in Canada or India quite equal to those executed in England or France.

Indeed, we may almost conclude that no one country has any very special advantage over another, excepting perhaps England, with its slightly misty atmosphere, which gives such beautiful distances in photographic pictures, and may account for the English landscapes being the best exhibited. English
landscapes.

To see the photographs systematically (there are about 600 exhibitors) we must begin with the French gallery, and continuing in the same circle of the building, we shall make the tour of the whole collection, in the following order:—France, England, India, Canada and other British colonies, Brazil, America, Constantinople, Rome, Italy, Russia, Sweden, Norway, Denmark, Portugal, Spain, Switzerland, Austria, Würtemberg, Baden, Hesse, Prussia, Holland, Belgium, and Algiers; and, after passing through this interesting series of works, we shall have seen the finest panorama that has yet been produced of the civilised world. If we consider these beautiful photographs, and the knowledge they convey to us, not only of the external appearance, but also of the manners and customs of the people, of so many distant countries, and then reflect (those of us who are old enough) how little we knew of these same countries some twenty-five years ago, we may well be thankful for the information and pleasure afforded by the art of photography.

FRANCE.

To begin with the French contributions, the first to be noticed are the portraits by Adam-Salomon F. (French Cat. No. 1), the well-known sculptor, whose bas-relief of Charlotte Corday was so great a favourite with the Parisian public some ten or twelve years ago. At that time M. Salomon was a neighbour of Mr. Bingham's, and, having the entrée to his France.

MR.
THOMPSON
ON PHOTO-
GRAPHY

atelier, M. Salomon had ample opportunities of becoming acquainted with the method pursued by Mr. Bingham in producing the beautiful photographs for which he is so justly celebrated, M. Salomon soon turned to account the knowledge thus acquired by adopting the art professionally. His pictures are remarkable for the admirable pose of his sitters, the good arrangement of light and shade, and the agreeable tone in which they are printed.

13. Bertall shows some portraits of considerable merit.

43. Cuvelier, E., views in the forest of Fontainebleau, from paper negatives. These landscapes are well selected, and are excellent specimens of the good old Talbotype process, now so much neglected in England.

64. Erwin, H., album-sized portraits, very clear, delicate, and effective.

91. Renaud, Jean A., exhibits a collection of good landscapes, the aqueduct and château de Maintenon, and other subjects; they show excellent photographic qualities, and are by the Tannin process.

52. Delondre, P.; these landscapes from waxed paper negatives are good.

124. Muzet and Joguet, of Lyons, exhibit landscapes beautifully rendered.

150. Robert, L. Photographs of objects made at the Imperial manufactory of Sèvres. They are well grouped, and the photographs are very effective.

33. Champion, P. A series of views, and groups of figures, taken in China and Japan; interesting as showing the architecture and types of the natives. The porcelain tower or summer palace, sedan chairs with native carriers, and group of musicians are amongst the best in the collection.

119. Lyte, Maxwell, as usual has some interesting landscapes taken in the Pyrenees. The view with the Chapelle de Poney le Hun in the middle distance is exceedingly grand. The details of the most distant mountains are beautifully defined. Mr. Lyte's photographs are sometimes rather heavy in the shadows.

24. Bretillot, M., exhibits some very good landscapes.

173. Vauvray, H. His album portraits are very good in colour and arrangement.

32. Carjet and Co. show some clever portraits of a large size.

Richebourg contributes photographs of drawings, &c., executed with great skill. Some studies of fowls, a lady's hand, and a bunch of grapes, are all clever in their way.

66. Ferrier and Son show some excellent landscapes, and also some good positives on glass.

40. Colliau, E., exhibits some excellent studies of clouds.

149. Reutlinger, Ch. His portraits are very successful, and amongst the best in the Exhibition. Those of Eva Rosée, Mdle. Pierson, Rose Deschamps, and Mdle. N. Martine are very perfect photographs.

63. Duvet, A., of Amiens, exhibits an excellent view of the Cathedral. It is the largest photograph in the Exhibition, being about eight feet high. The detail of the architecture is well defined, and the vertical lines of the building quite correct.

162. Soulier, C., contributes some very fine photographs made in Rome, especially the tomb of Julius II., by Michael Angelo, the Coliseum, and the arch of Septimus Severus.

23. Braun, A., has a large collection of works; amongst the most striking are two groups of dead game, photographs of large size, printed in carbon. These are so successful as to leave nothing to be desired.

31. Cammas, H., fine paper negatives of views in Egypt.

7. Baldus, E., exhibits some beautiful heliographs. His Lucretia, St. Cecilia, and the Virgin, copies from the well-known engravings by Marc Antonio, are especially deserving of notice.

125. Nigre, Ch., also exhibits some favourable specimens of heliography.

100. Lafon de Camorsac shows a large series of enamelled photographs, most of them very successful.

17. Bingham, R. J., maintains his pre-eminence for his admirable copies of pictures; amongst his contributions may be seen photographic reproductions of the works of all the leading painters of Paris. He also exhibits some very successful carbon pictures, printed by the Woodbury process. Mr. Bingham and Mr. Maxwell Lyte are both Englishmen, but, pursuing their art in France, they exhibit in the French department.

ENGLAND.

It would be remarkable if the English contributions were not conspicuous in this world-gathering of photography. England.

Our great strength is in our beautiful landscapes; in these we are unequalled, as the works of Messrs. Bedford, Mudd, Wardley, Tod, H. White, Beasley, Rouch, Vernon Heath, England, and others testify. But in portraiture we do not hold so good a position in this Exhibition as we ought. Austria, France, and other countries show better portraits than we do; why this deficiency? We have the best of lenses and chemicals, and a climate equal to any in the world for photography. The reason is, that our photographers, as

MR.
THOMPSON
ON PHOTO-
GRAPHY.
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a rule, do not sufficiently study the pose of their sitters, and the light and shade of their pictures. This is a matter demanding serious consideration from those desirous of acquiring and maintaining a reputation for photographic portraiture. Among the best of many good works are the following:—

4. Beasley exhibits some very successful photographs by the Fothergill process. "At Hungerford" is a very characteristic phase of English scenery.

6. Bedford, F., has a great show of beautiful landscapes, remarkable for their refined effects and perfect photography. "The Castle Grove, Kenilworth," "Collossi," on the plain of Thebes; "Ruined Temples at Baalbec," and "Bridge over the Lledr, North Wales," are charming works of art.

34. England, W., is another exhibitor whose works are most perfect. His views in Switzerland have a character in them quite distinct from the works of any other photographer.

99. Wardley, G., exhibits views in Wales which are little gems of photography. The same may be also said of his "Langdale Pikes, Westmoreland," and "Castle Crag, Borrowdale, Cumberland."

77. Robinson, H. P., contributes several of his well-known photographs; "A Mountain Dew Girl," and "On the Way to Market," are both successful pictures.

68. Mudd, J., exhibits landscapes which are among the very best in the Exhibition; for vigour and at the same time great delicacy, they have scarcely their equal. His "View on the Llugwy, North Wales," "Trees in Dunham Park, Cheshire," and "The Hermitage Bridge, Dunkeld," are beautiful works.

17. Mrs. Cameron shows many of her admirable works, full of artistic feeling and refinement.

101. White, H., has, as usual, some charming landscapes; the points of view selected with great judgment, and taken at a time of day when the light was favourable for the chiaroscuro of his pictures.

106. Wortley, Colonel Stuart, exhibits a series of landscapes remarkable for the beautiful delineation of cloudy skies.

94. Tod, Captain A. G., is evidently a lover of English lane scenery, which he depicts with admirable taste and judgment. His printing is perfect.

13. Brownrigg, T. M., shows scenes in the Dargle, and other views in Ireland, full of beauty.

78. Ross, J., Edinburgh, is very successful in his portraits

of children. Many of these pictures must have given the fathers and mothers great satisfaction.

43. Haes, F., seems to be quite at home with the wild animals in the Zoological Gardens; his portraits of the tiger, ourang-outang, cheetah, bison, and others are admirable in their way.

31. Dunmore, E., exhibits good landscapes. He has a style of his own, very forcible, and at the same time delicate.

23. Cramb Brothers, Glasgow, show some admirable photographs made in the Holy Land on dry albumenised plates, prepared in Glasgow. "The Church of St. Anne," Jerusalem, and "The Mosque of Omer," are especially good.

5. Bean, A., exhibits some of the best portraits in the English division.

48. Hemphill, W. D., M.D., contributes some excellent figure-subjects, full of thought and cleverness. They are somewhat in the style of the beautiful works of the late Lady Hawarden.

62. Mayall, J. E., exhibits five different sized portraits of himself enlarged from a carte-de-visite, all very good likenesses and good photographs.

Joubert, E., sends a frame of enamelled photographic portraits, many of them very successful.

20. Claudet, A., exhibits a collection of portraits executed with his usual care.

28. Debenham, W. E., has also some good portraits, especially a frame of cartes-de-visite.

The stereoscopic views by G. W. Wilson, V. Blanchard, the London Stereoscopic Company, and W. England, are all admirable works.

ENGLISH POSSESSIONS AND COLONIES.

INDIA.—There are but few photographs exhibited in the department for India; but a collection of types of Indian character from Delhi, Scinde, Bhurtpore, Rajpoutana, Bengal, Assam, and other districts, produced under the direction of Dr. Forbes Watson, possesses considerable merit.

India and
English
colonies.

Bourne and Shepherd, Simla, exhibit photographic views, taken in India, of the beautiful scenery of Cashmere and other places, which will delight everyone who sees them. In the English department of the history of labour is a large and most interesting collection of photographs illustrating Indian architecture, such as "The Bridge on the Marquel Canal," "Bheem Tal," "The Lake from near the Dak Bungalow," "The Tomb of the Emperor Togluk," &c.

CANADA.—Henderson, A., Montreal, has a very large collection of Canadian views, especially from the neighbour-

MR.
THOMPSON
ON PHOTO-
GRAPHY.

hood of Quebec and on the Ottawa River. These photographs must convey a good idea of the splendour and picturesque character of Canadian landscape. Some of them have been produced instantaneously. Notman, W., Montreal, exhibits large and small portraits of great merit. He also contributes some skating scenes on the St. Lawrence, seal-stalking amongst the ice, and the caribou-stalking in the middle of the wild and romantic country between St. Urbain and Lake St. John. Mr. Notman's photographs leave little to be desired. Mr. McLaughlin, photographer to the Board of Works, Canada, exhibits views of Quebec and Montreal, scenes of the timber trade on the Ottawa, timber yards of Quebec, falls of Montmorency, and delicious wood scenery taken both in summer and in the spring, when the ice, melting under the rays of the sun, gives a peculiar and striking feature to the picture; also public buildings at Ottawa, all excellent photographs. Livernois, of Quebec, contributes photographs from historical paintings, engravings, plans, and portraits, illustrative of the history of Canada; also a collection of forest trees and plants, and detailed parts for study. He also exhibits some good landscapes. Smeaton, J., of Quebec, exhibits interesting views of miners at work, at rest, and travelling in the gold-fields of the river Chaudière, near Quebec; they give a graphic portraiture of a miner's life and of the splendid wild scenes of the native Canadian forests. Ellison and Co., Quebec, send views of Quebec and its environs, autumnal scenes of Canada, &c.

There are also a few photographs from Malta, Natal, Queensland, Victoria, and other British colonies, but they are not of a character to call for special notice.

BRAZIL.

Brazil.

G. Luzinger, Rio de Janeiro, exhibits large panoramic views of Rio de Janeiro, the Praia Grand, Bay of Rio de Janeiro, and other views, all admirable photographs of a charming-looking country. The portraits by Carneira and Gasper, J. F. Guimaraes, and Insley Pacheco are all good.

AMERICA.

America.

Laurence and Houseworth, San Francisco, send a series of views taken in California, portraying most admirably the grand rock and river scenery of the country, which seems to abound with charming waterfalls, rapid rivers, and rocks with almost perpendicular faces, rising 3,000 feet from their base. In none of these pictures do we see the least signs of man, not a log-hut nor an axe-felled tree to indicate his presence; all seems wild primitive nature, which gives a great charm to these very excellent photographs.

13. L. Rutherford, New York, exhibits a large and very clever photograph of the moon, showing its wonderful surface remarkably well; he also shows a very excellent photograph of the solar spectrum.

MR.
THOMPSON
ON PHOTO-
GRAPHY.

There is a good display of portraits by F. Gutekunst, of Philadelphia; A. Gardner, of Washington; and Williamson, of Brooklyn, New York. The latter exhibits life-sized portraits of considerable merit.

OTTOMAN EMPIRE.

From Turkey we have two large panoramic views of Constantinople, showing very completely the city of domes, and the shipping in the Bosphorus. There is also a large portrait exhibited of his Majesty the Sultan. Turkey.

ROME

sends a series of photographs of the paintings by Julio Romano and other pupils of Raphael, in the Loggia of the Vatican, representing "The Creation," "The Fall," "The Finding of Moses," &c., also a fine photograph of the "Galatea," and other works of Raphael. Italy.

ITALY.

From Italy we have some fine photographs of the celebrated fresco paintings, by Giotto, in the chapel of the Annunziata dell'Arena, at Padua. These admirable works are by C. Naya (13). In the same collection are also some beautiful photographs from the works of Mantegna.

14. Perini, A., sends a volume of photographs from original works by Raphael, Julio Romano, Perugino, Michael Angelo, and other great masters. More than 80 in the collection are from drawings by Raphael. M. Perini also shows a collection of photographs from the ancient arms and armour at Turin. These are very interesting works from Italy, but, being kept in a glass case, seeing them is attended with some difficulty. There is also a collection of photographs from Italy hung on the wall of the inner garden of the Exhibition. Many are by Naya; and there are some clever photographs of ships by Alphonso Bernoud, of Naples.

RUSSIA.

We have from Russia a large collection of photographs from the atelier of the état major of the army of the Caucasus. These pictures portray rocky landscapes, buildings with a strong feeling of eastern architecture in them, and native costumes—all interesting, as illustrating a country not much known to Europeans. They are successful photographs. Russia.

MR.
THOMPSON
ON PHOTO-
GRAPHY.

1. Alassine, A., Moscow, contributes some excellent views of the Kremlin and its environs. This celebrated fortress seems to inclose some beautiful specimens of Byzantine architecture, if we may judge by the many domes and minarets above its walls. The view of the village of Mazilowa is very charming, as is also the "Temple de l'Intercession de la Vierge" and "St. Basil le Bien Heureux."

H. Dernier, A. Bergamasco, and M. Fajans exhibit good portraits.

Kloch and Dutkiewicz exhibit four groups of tropical plants well arranged and cleverly photographed.

Lissitzine, C., an album containing a series of photographs of horses, interesting as showing the characteristic varieties of this noble animal in Russia.

SWEDEN.

Sweden.

2. Eurenus and Quist exhibit some cleverly executed interior views of the International Exhibition held at Stockholm in 1866. Their portraits are also commendable.

5. Joop, G., shows a large photograph of the members of the Academy of Fine Arts at Stockholm. There are 30 figures well grouped. He also exhibits two charming subjects—a girl seated with a basket by her side, and a little child sitting cross-legged with a large book in her lap. These are excellent photographs.

4. Jaeger, J., is very successful in his copies of pictures and drawings. Mandel, Ph., is also clever in similar productions.

NORWAY.

Norway.

5. Selmer, M., exhibits a series of costumes of the Norwegian peasantry, very interesting good photographs.

DENMARK.

Denmark.

There is not a very important display from Denmark; but, as might be expected, several of the exhibitors show photographs of the works of their great sculptor Thorwaldsen. His "Night and Morning," "Cupid and Psyche," and "Ganymede" have been well reproduced by Budtz, Müller, and Co., Tillge, Hansen, and Kaysen.

Peterson, J., exhibits some beautiful cartes-de-visite and other portraits, well arranged and very harmonious. Those by Holtzweissig are also good.

4. Harboe, E. W., exhibits some street and other views. His exterior of a village cabin and entrance to a farm are highly successful.

PORTUGAL.

The Portuguese photographs are few in number, but there are some interesting architectural views taken at Belem, Batalha, and Coimbra. In the "History of Labour" are some excellent photographs of some of their magnificent ancient state carriages.

MR.
THOMPSON
ON PHOTO-
GRAPHY.
—
Portugal.

GREECE.

Constantine, of Athens, has a series of beautiful and well-known photographs of ruins in Greece.

SPAIN.

9. Martinez and Hebert (Madrid) exhibit some life-sized portraits, among the best in the Exhibition for clearness and absence of distortion. They also show some good figure groups.

3. Fernandez, A. N., exhibits some enlarged photographs.

7. Eusebio, J. and G. (Madrid) also show large photographs and cartes-de visite.

SWITZERLAND.

6. Poney, F. (Geneva), contributes some very good reproductions from drawings and paintings, executed with brilliancy and well printed.

1. Hoissonas, H. (Geneva), a child sitting on a carpet and leaning on a dog; a very clever large photograph—the head of the dog particularly good.

Messrs. Chevalier (of Geneva), Gysi, F. (of Aaran), and Bruder, Frères (of Neufchatel), exhibit good portraits.

WIRTEMBERG.

Brandseph, Fr. (of Stutgard), is the only exhibitor, and contributes some large portraits of considerable merit; also a view of the "Place du Château," or Royal palace, with the column of Concord in the foreground; this photograph is about 5½ ft. in length, and is in three pieces.

AUSTRIA.

From Austria we have an excellent photographic display, at the head of which are the works of Louis Angerer, of Vienna; he exhibits large and small portraits, family groups, architectural subjects, copies of paintings and drawings, composition pictures, &c., all admirably produced. Mons. Angerer uses Voigtländer lenses, and the results shown by his photographs prove these lenses to be worthy of the great reputation they enjoy.

3. Angerer, V., exhibits some interior views (carte-de-visite size) of four or five persons grouped together. These small photographs are well arranged.

MR.
THOMPSON
ON PHOTO-
GRAPHY.

6. Benque and Sebastianutti, of Trieste, exhibit some very good and large photographs, especially one of an Italian peasant, standing with her hands clasped behind her head. The drapery of this figure is well arranged. They also exhibit four composition subjects. The best of these—musicians playing before a rustic doorway to a group of listeners—is, perhaps, the most ambitious picture in the Exhibition, and of its kind one of the most perfect; but composition pictures are not suited for photography, the most successful being invariably more or less a failure.

57. Widter, A. (Vienna), exhibits some admirable photographs of armour.

12. Glatz, T., has succeeded well in his photographic reproduction of an old missal—a task not easily accomplished, on account of the yellowness of the vellum and the great use made of gold in ancient illuminated manuscripts.

36. Perlmutter, A., shows some very good half-length portraits on carte-de-visite sized mounts; also some album portraits, well posed, with good light and shadow.

23. Kramer, O., exhibits an enlarged photograph of a dancing-girl, good from being perfectly free from distortion. About 4 ft. high.

26. Leth, J., exhibits a collection of photographs from wood engravings by Albert Durer. Some of these are good, but many are wanting in firmness of outline.

Bauer, J., Jagermann, C., and Mahlke, C., contribute some very good portraits.

On the whole, Austria may be well satisfied with her photographic exhibition.

BADEN.

Baden.

1. Meder, L., exhibits views of Baden and Heidelberg of a large size. There is a want of atmosphere in these pictures.

2. Franz, R., views of the château of Heidelberg; small but good photographs.

HESSE.

Hesse.
Prussia.

Bruckman, F., and Shafer contribute some excellent reproductions from paintings. They are exhibited by Trapp and Munch, of Fribourg.

PRUSSIA.

33. Dr. H. Vogel sends a varied collection of photographs from the Royal Polytechnic Academy, Berlin. Amongst them are some small landscapes of great merit; also two very vigorous photographs, taken from the well-known group of

the Amazon by Kiss, and another after the same sculptor of a head of St. George. The light and shade in these pictures is very well arranged.

MR.
THOMPSON
ON PHOTO-
GRAPHY.

16. Loescher and Petsch have some good portraits, especially those of Dr. Vogel and Professor Hofmann; these are well printed.

42. Milster, E., exhibits some very successful copies of pictures, his portraits are also artistically arranged.

24. Wigand, C., is also successful in his portraits.

28. Remilé, P., shows some landscapes with very good detail of foliage; unfortunately the points of view, so important in landscape photography, have not been well chosen.

45. Graf, H., contributes largely, and many of his portraits are well posed, but rather wanting in refinement; the colour of his printing is also objectionable.

Brandt, F., exhibits a volume of photographs of carved wood furniture, from the fifteenth to the eighteenth century, in the possession of Dr. Thaulow, of Kiel. Many of these specimens are beautifully rich in design, but the photographs are on too small a scale to show well the detail of some of the pieces.

Graf, P., sends architectural views and portraits, and Suck, C., landscapes and portraits all carefully executed. Volkenburg's studies of trees should prove useful to young artists.

Schauer, G., Berlin, exhibits copies of pictures. Friedrich II. at a dinner party at Sanssouci, from a picture by A. Meuzel, is a remarkable photograph, both for its size and its good qualities.

HOLLAND.

3. Virveer, M., portraits large and small, and groups. Holland. These pictures are all artistically arranged, and have a character very distinct from all other photographs in the Exhibition; in composition they very much resemble some of Rembrandt's etchings.

5. Baer, J., of Rotterdam, a large collection of portraits, large and small, and many of them of great beauty.

BELGIUM.

5. Fierlents and Co. contribute a series of interesting photographs from the paintings of H. Leys and other masters. Belgium. They represent M. Leys' pictures very fairly, but are rather heavy in tone. The Royal Photographic Society of Belgium also contributes a large collection of photographs from pic-

MR.
THOMPSON
ON PHOTO-
GRAPHY.

tures and drawings in the Wurtz Museum. These are also by Fierlants, and are remarkable photographs.

10. Maes, J. (Antwerp), sends some good copies of pictures.

7. Ghimar (frères) oval portraits, life-size, which are clever, but very much painted upon.

ALGIERS.

Algiers.

Some interesting photographs are contributed by Captain de Champlouis, of the Corps Impérial and Etat-Major, and by Captain Piboul. They are principally views in the south of Algiers. Several, showing the sandy wastes of that country, are very striking.

In concluding this report it should be stated that there are very many admirable photographs not noticed in it. The object has been to draw attention to the most successful works exhibited by each country.

REPORT upon MUSICAL INSTRUMENTS.—(Class 10.)

By FREDERIC CLAY, Esq.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

THE manufacture of musical instruments in the exhibition may be said to be admirably represented, both as regards numerical strength and intrinsic excellence. A better show has never, probably, been before collected under one roof; and although much of absolute novelty cannot be looked for in a branch of manufacture for which science and art have already combined to do so much, it is satisfactory to find that improvements are still forthcoming, and that instruments which have hitherto been faulty in their nature are now rendered, if not quite perfect, at all events comparatively free from the defects under which they have laboured up to the present time. This will be remarked chiefly in respect of wind instruments of all kinds, the manufacture of which both as to the excellence of their construction, and the moderate price at which they can now be produced, shows a notable advancement on former exhibitions.

As I have said, the number of instruments exhibited is considerable, and it would not be possible, nor would it be necessary, to notice in detail all the different specimens of musical manufacture which are here to be seen; but in accompanying the visitor over ground which I have myself trodden, it will be my endeavour, in the present report, to direct attention to any objects which, by reason either of novelty or of special excellence, would seem to deserve notice. I should mention that it must not be supposed that every instrument exhibited is intended as an example of excellence alone; for in some cases the manufacturer has had in view economy of price as his chief object, whilst in others the instruments produced are interesting rather as indications than as musical results.

I propose to depart from the plan which has been adopted in the "Catalogue Général"—namely of noticing the products of each country separately. For our purpose, I incline to think that it will be more convenient to take one instrument at a time and to see how far its interests have been represented by the exhibitors of different countries.

PIANOFORTES.

The first instrument, perhaps, in importance, and certainly in general acceptance, which claims our attention is undoubtedly the pianoforte. It is almost needless to say that the

MR. CLAY
ON MUSICAL
INSTRUMENTS.

French
pianos.

number of pianos in the Exhibition far exceeds that of any other instrument. The most extensive contributor is France.

At the head of the list of exhibitors of French pianos we find the names of Pleyel et Wolf, Henri Herz, and Erard. They have all sent grands, obliques, and uprights; and the instruments exhibited may be characterized as possessing a pure and even tone, a facile touch, and more than an average share of brilliancy. In the matter of power or sonority, I incline to think that they are somewhat deficient. Their internal mechanism, however, especially in the case of Pleyel's pianos, is excellent, and the instruments are invariably well got up. MM. Kriegelstein (père et fils) and Yot Schreck et Cie. have sent capital instruments; and the names of MM. Franche, Gaveau, Philippi (frères), Pape fils, Gaudemot, Musard, Pasdeloup, Avisseau aîné, Hensel, Bucher, &c., are represented by pianos of more or less merit. These latter instruments are for the most part similar in their nature, being characterized by a level smoothness of tone, and a delicate, if not a brilliant touch. The prices of French pianos range from 500f. to 4000f. Instruments, however, cased in ebony, walnut, or coromandel are naturally more expensive.

I think a word of notice should be accorded to a miniature sized piano which has been exhibited by M. Blanchet, and is specially designed for use on board steam-boats, or for other positions where the space at disposal may necessarily be limited. Having regard to its size, this little instrument is remarkable. Its price is 1,400f.

In the French section will also be found an instrument called the "piano quatuor," exhibited by M. Baudet aîné. In form it resembles an upright pianoforte, and the performer sits at a row of keys, as though he were playing the piano; but the strings inside the instrument are not struck, but are, so to speak, bowed by a roller, which is caused to revolve, and which meeting the string pressed on the keyboard, imparts to it a sound as though of a stringed instrument. In the lower register a fairly good violoncello tone is produced, and the instrument is, altogether, an ingenious contrivance, but cannot as yet lay claim to any great value as a musical result.

As an illustration of the saying that there is nothing new under the sun, it may not be uninteresting to quote, in connexion with the instrument above referred to, the following extract from Mr. Pepys' Diary.

"October 5th, 1664. To the musique meeting at the Post Office, where I was once before, and thither anon come all the Gresham college, and a great deal of noble company;

and the new instrument was brought, called the arched viall, where, being tuned with lute strings, and played on with keys like an organ, a piece of parchment is always kept moving; and the strings which by the keys are pressed down upon it, are grated in imitation of a bow by the parchment; and so it is intended to resemble several vialls played on with one bow, but so basely and so harshly that it will never do. But after three hours' stay, it could not be fixed in tune, and so they were fain to go to some other musique of instruments."

MR. CLAY
ON MUSICAL
INSTRUMENTS.

French
pianos.

M. Gaidon furnishes an upright piano, with a repeating movement, to give the effect of a note played *martellato*.

Whilst speaking of the French pianos, I may draw attention to a machine, patented by M. Auguste Vincent, entitled "Machine à délier les doigts." It is a species of treadmill, designed to strengthen the fingers, and, as it brings into play the muscles and joints employed in piano-playing, I have little doubt but that in many cases the invention may be found useful.

In concluding my remarks on the French pianos, I may mention that they are generally inexpensive, and if, for the most part somewhat deficient in power, they are at all events, pleasant toned instruments, and agreeable to play upon. I am of opinion that MM. Pleyel et Wolf have furnished the best specimens of French pianos.

ENGLAND.—The number of British exhibitors who have sent pianofortes amounts to six—namely, Messrs. Broadwood, Kirkman, Wornum, Alison, Lakin, and Brinsmead. It is a noticeable fact, and one to be regretted, that the names of firms so eminent as Messrs. Erard and Messrs. Collard should be absent from the catalogue; but it must be owned that the instruments exhibited are amply sufficient to sustain the well-merited reputation which has been earned by England for this class of musical manufacture.

English
pianos.

Messrs. Broadwood have sent four splendid "concert grands," cased in oak, rosewood, and other kinds of wood. I consider the instrument in the oaken case to be the finest, and it is impossible to conceive sonority, brilliancy with depth and purity of tone, more admirably combined than in the piano to which I refer. It is indubitable that there is no finer instrument in the Exhibition, and it is a question whether there be any one so fine. The price of this instrument is 200 guineas; its neighbours, however, cased in more costly woods, are valued at double that sum. Messrs. Broadwood have also sent oblique instruments which may be highly commended.

Messrs. Kirkman exhibit two full grands, a "boudoir

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

English
pianos.

“grand,” and a “piccolo ;” and too much praise can scarcely be awarded to this firm for the altogether admirable specimens which they have now placed before the public. From their full grand at 175 guineas, down to the piccolo at 48 guineas, the instruments are, one and all, excellent.

Mr. R. Wornum has sent grand and square pianos and a piccolo ; the latter is a capital instrument. With regard to the first named, on opening the piano it will be found to present a different appearance from other instruments. The absence of “metal bracings” will be noticed, and it will be found that the instrument is constructed on what is known as the down striking principle, in contradistinction to the “up blow” in general use. This principle appears to have been invented so early as 1774, and amongst its advantages it appears that the employment of iron may be avoided. It will be readily understood that a piano constructed entirely of wood can be produced at a comparatively moderate price. The grand and square pianos exhibited by Mr. Wornum are constructed on a plan based upon this system. The price of the grand is 135 guineas.

The pianos exhibited by Mr. Ralph Alison and Sons are small instruments, and the most noteworthy appears to me to be that styled the “Royal London Model.” Its advantages consist in its cheapness (which is attributable to the fact that it is entirely made by machinery), and a patent action, or rather an action original so far as regards upright instruments. In this piano the escapement takes place (as in the grand piano) from the *butt* of the hammer, and a crisp touch is obtained which is rarely found in instruments of its class. Its price is 23*l.*, and I consider this piano very remarkable as a combination of cheapness and excellence.

Mr. Lakin's
invention
for tuning
pianos.

The specimens which Mr. Lakin exhibits should be noticed on account of an invention whereby the instrument can be easily tuned. It will be seen that a metallic plate of an angle shape extends along the front of the piano. This is attached by screws to the bracings or upper portion of the instrument. In the front part of this plate tuning-pins are fixed, one for each string ; levers resting on a fulcrum bar or base are also employed. The upper arm of each lever is made to move in a groove formed in the angle plate, whilst to the lower arm of each lever the string is attached ; by the action of the tuning-pin on the upper arm of the lever the string is raised or lowered in pitch with perfect ease. This invention assuredly renders the mechanical portion of piano-tuning a simple matter enough ; but I fear that an amateur will always find the work of tuning an instrument more tedious and difficult than might be anticipated. The piano is, after all, an imper-

fect instrument, so far as regards intonation, and to make the proper allowance for its unavoidable defects is a study requiring patience and practice. Mr. Lakin's invention is, however, entitled to much commendation.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

Mr. John Brinsmead furnishes grand, oblique, and upright pianos. Some of these instruments have been in use five years, and are now exhibited in proof of their durability. They are good instruments. A patent for perfect check and repeater action for grands and uprights was taken out by Mr. Brinsmead in 1862.

English
pianos.

I may mention, for the guidance of the visitor, that the greater part of these instruments, together with the organs, harmoniums, and wind instruments in the English section, are under the charge of Mr. Lavender. He is courteous and attentive; and, being perfectly well acquainted with the nature of the instruments confided to his care, can afford any information regarding them which may be required.

BELGIUM.—The pianos exhibited by Belgian manufacturers bear a strong resemblance to those displayed in the French section. They are smooth and even-toned instruments, but they appear to me to be somewhat wanting in strength and sonority. They are, for the most part, extremely well got up, and their prices are generally moderate. The names of the principal exhibitors are Messrs. Günther, Sternberg, Vogelsangs, Boone et Fils, Hoeberechts et Fils, Doperé, and Berden et Cie.; and I am inclined to think that the best instruments have been furnished by the three firms I have named first.

Belgian
pianos.

PRUSSIA.—The names of the principal exhibitors are Messrs. Blüthner, Bechstein, Knake, Schwechten and Breitkopft; Messrs. Irmeler, Ibach (of Barmen), Westermann, Duysen, Gurike, Klaus, Spangenberg, and others have also sent specimens of their workmanship.

I cannot say that I am pleased with these instruments; in some instances—to wit, the pianos sent by Messrs. Blüthner, Knake, Breitkopft and Schwechten—the touch will be found to be good and the tone brilliant; but, on the whole, I find the instruments somewhat unequal, and, as a rule, wanting in strength and character. The grand piano sent by Blüthner is an exception; it is, to my thinking the best exhibited in the Prussian section, and is altogether a capital instrument.

WÜRTEMBERG.—The pianos sent from this country are almost all made in Stuttgart, and are remarkable for their cheapness. Messrs. Schiedmayer, Kaim and Gunther, Ochler, Dörner, Haegele, Pfeiffer, and Hardt are the exhibitors. Herr Schiedmayer has sent a grand piano, price

MR. CLAY
ON MUSICAL
INSTRUMENTS.

1,400f.; and Herr Dörner a grand, price 1,500f., and also a square, price 550f.: all these instruments are to be commended, and not alone for their cheapness. The piano of Schiedmayer is quite excellent, both in tone and general construction; even allowing for the cheapness of labour in Germany, there can be no question but that the price at which this piano can be sold is moderate in the extreme.

SPAIN.—The Spanish exhibitors are few, and their specimens are noticeable rather on account of external good looks than intrinsic excellence. The pianos sent have been constructed by Messrs. Montano (Madrid), Eslava (Madrid), Auger (Barcelona), Bernareggi and Co. (Barcelona), and Llocker (Madrid).

DENMARK.—Messrs. Hornung and Moeller, Wulff, Nehammer, and Soerensen: the first-named contributes two small and agreeable grands; the other instruments are square and upright.

SWEDEN.—In the Swedish section will be found a small-sized grand piano, price 2,200f.: it has a pleasant tone, but lacks strength and brilliancy. It is sent by Hals Frères (of Christiana). The only other exhibitor is Stavenow (of Stockholm).

ITALY.—The names of the principal exhibitors are Messrs. Peter (of Naples), Maltarello (of Vicenza), Stanziere (of Naples), Mola (of Turin), and Marchisio Frères (of Turin). These instruments do not appear to me to claim any great amount of attention. The tone of some of the instruments is sufficiently pleasing, but they are deficient in strength and character.

AUSTRIA.—There are some capital pianos in the Austrian section, and first on the list should, I think, be placed a grand piano sent by Streicher, of Vienna, which, in point of brilliancy, sonority, and general excellence of construction, has every right to be ranked amongst instruments of the first class. Messrs. Ehrbar (Vienna), Promberger (Vienna), Bösendorfer (Vienna), and Beregszasy (Hungary), have, however, sent some very admirable pianos, and it is hard to say that one instrument is better than the other. The entire collection is well worth attention.

RUSSIA has sent but few pianos; those exhibited by Malecki and Schreder, of Warsaw, and Krall and Seidler, of Warsaw, are the best.

AMERICA.—The pianos contributed by the United States must be praised unreservedly. The exhibitors are three in number—Messrs. Steinway (of New York), Chickering (of Boston and New York), and Lindemann (of New York).

The instruments exhibited consist of concert grands, cycloids, squares, and uprights. It appears, however, that the upright form of piano is not in favour in the States, and that the square piano still flourishes there, although it has been for the most part abandoned in other countries. In fact, I am told that the number of square pianos manufactured in the United States amounts to full 95 per cent. of all the instruments made.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

American
pianos.

The firm of Messrs. Chickering appears to have been the first in America to manufacture grand pianos at all. Until the beginning of this century the art was, so to speak, unknown in the States; and the demand for instruments, such as it was, could readily be supplied by European markets. From the year 1825 the first evidence of progress can be traced; but manufacturers do not seem to have turned their attention to grand instruments until about the year 1840. The first in the field was the late Mr. Jonas Chickering, of Boston. His pianos appear to have been modelled on those of Erard, of Paris, but were constructed with the full iron frame. The line of the wrest plank bridge consisted of an iron ledge projecting upwards from the iron frame. Into this ledge holes were drilled, which were lined with cloth; and through these the strings were laid. Mr. Chickering took out a patent for this upward projecting ledge in 1843. It is interesting to trace the steady yet rapid progress which has been made in the manufacture of American pianos, but, having regard to the space at my disposal, I fear I must pass over the intermediate improvements effected by Messrs. Chickering, and come at once to the superb instruments which are now standing in their name at the Exhibition. It is impossible to speak too highly of these pianos; whether it be in tone, or touch, or general appearance, and construction, it is alike difficult to find anything to criticise. Having said thus much, I think I need say no more.

Messrs.
Chickering
of Boston.

Messrs. Steinway and Sons are a younger firm than that of which I have just now spoken, but in other respects they are on equal terms. Messrs. Steinway's pianos will bear satisfactory comparison, not alone with Messrs. Chickering's, but with those of any manufacturer in the world. It seems that the first grand piano turned out by this firm in America was made in 1856, and it is surprising that in 11 years such results should have been obtained. Messrs. Steinway have taken out various patents for inventions, new grand piano actions, &c.; but the improvement on which they lay the greatest stress was patented by them in December 1859. It consisted (I will use their own words) "of the introduction of a complete cast-iron frame, the projection for the

Messrs.
Steinway of
New York.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

“ agraffes lapping over and abutting against the wrest plank,
“ together with an entirely new arrangement of the strings
“ and braces of this iron frame, by which the most important
“ and advantageous results were achieved. The strings
“ were arranged in such a position that in the treble register
“ their direction remained parallel with the blow of the
“ hammers, whilst from the centre of the scale the unisons
“ of the strings were gradually spread from right to left in
“ the form of a fan, along the bridge of the sounding board,
“ the covered strings of the lower octaves being laid a little
“ higher and crossing the other ones (in the same manner as
“ the other strings), and spread from left to right on a
“ lengthened sound-board bass bridge, which ran in a parallel
“ direction to the first bridge. By this arrangement several
“ important advantages were obtained; by the longer bridges
“ of the sounding-board a greater portion of its surface was
“ covered; the space between the unisons of the strings
“ was increased, by which means the sound was more power-
“ fully developed from the sounding-board, the bridges being
“ moved from the iron-covered edges nearer to the middle of
“ the sounding-board, producing a larger volume of tone,
“ whilst the oblique position of these strings to the blow of
“ the hammers resulted in obtaining those rotating vibra-
“ tions which gave to the thicker strings a softness and
“ pliability never previously known.”

The instruments exhibited by Messrs. Steinway consist of two concert grands, a “parlour grand,” a square, and an upright. With regard to the grand pianos, I can only say that the specimens now placed before the public are, in my opinion, as fine as pianos can be. Every attribute of a splendid instrument is here; strength, depth, sonority, brilliancy, facility of touch, and excellence of construction, combine to make Messrs. Steinway’s concert-grand a piano of the very first excellence. His other instruments are every bit as remarkable, and I should say that such a square piano was never heard before; if such instruments are frequently turned out in the States I can readily understand that their vogue should continue. The price of the first grand, as also Messrs. Chickering’s best piano, is 300*l.*; they are cased in rosewood, and, by comparing them with instruments of similar calibre made by European manufacturers, it will be seen that the American pianos are the more expensive. The square piano to which I have alluded cost 180*l.*, but I am bound to say that, having regard to the rare excellence of the instruments, I consider them worth their money.

Messrs. Lindemann and Sons have sent a capital instrument, styled the “cycloid.” In appearance it resembles a

square piano, but its internal mechanism is different from that employed in square instruments. Its price is about 90*l*.

It will be seen that I have devoted the lion's share of the space at my disposal to an examination of the pianofortes. I have done so partly from the fact that the specimens of this class of musical manufacture are deserving of very great attention, but more especially because the piano is the instrument which will probably have the greatest interest for the greatest number of visitors. I have been given to understand that the judges have thought it right to award the highest honours, in equal measure, to the pianos sent by Messrs. Broadwood, Messrs. Steinway, and Messrs. Chickering. I do not think they could have done otherwise. I will not myself express an opinion as to the relative merits of these three manufacturers, but will leave visitors to judge for themselves between three specimens of workmanship, all as complete as it is possible to make them. I do not like to conclude my notice on the pianos without again drawing attention to the superb instrument exhibited by Messrs. Kirkman. But for the fact that his piano is a drawing-room grand rather than a concert-grand, I must needs have ranked it with those sent by Messrs. Steinway, Broadwood, and Chickering.

We now come to the

ORGANS.

I am not surprised to find that the organs sent for exhibition are few in number. The fact is, that the space which could be accorded to these instruments was necessarily limited, and manufacturers may, not unnaturally, have felt some hesitation in entering the lists unless they were at liberty to send the most extended and highly-elaborated specimens of their workmanship. I have no means of knowing this as a fact, but, *faute de mieux*, I conclude that to be the reason why only one full-sized cathedral organ is to be found in the Exhibition.

FRANCE.—The most important instrument on view is that constructed by Merklin-Schütze et Cie., of Paris, and I subjoin the principal details of its composition:—

1. Swell organ	-	-	56 Notes	-	10 stops.
2. Great organ	-	-	56 „	-	15 „
3. Recit Expressif	-	-	56 „	-	10 „
4. Pedal organ	-	-	27 „	-	9 „

44 stops.

5. Pedals for coupling and combination - 15

French
organs.
The great
organ built
by Merklin-
Schütze et
Cie.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

The elements of special excellence for which the manufacturers claim credit are as follow:—An improved system of feeding the instrument with air, whereby the organ is filled in more equal measure and with less physical labour than is generally required for an instrument of its calibre; the application of the system of complete pneumatic leverage to the great organ, and a special arrangement by which each row of keys is influenced; the disposition by groups and in series of the coupler pedals, and the pedals of combination; and the union in this instrument of stops of different systems of manufacture. This organ is designed for the new church at Nancy; and it must be owned that the splendid specimen is well worthy of a firm who have for some time enjoyed the reputation of turning out instruments of the highest class. This organ, from the large space which it requires, is not to be found amongst the other musical instruments; the visitor must, therefore, seek it in the section devoted to machinery, and must be content to form an opinion as to its unquestionable merits amid the din of revolving wheels. This unfortunate necessity is, of course, to be regretted, inasmuch as the delicate shades of the instrument are partially, if not wholly, lost.

As I have said, this organ is a superb instrument, both as to capability and construction; if I wished to be hypercritical I should say that, to my thinking, it is somewhat over-reeded; each stop, singly, is admirable; but the tone of the reed, whether it be the oboe, the clarionet, or the bassoon, will soon weary the ear unless its introduction is managed with the greatest possible care and judgment. It is not without hesitation that I have made this remark, because the instrument is one of the highest excellence, and really offers but little to criticise.

The organ
built by
Cavaillé-
Coll.

Fair organs have been sent by Damiens Frères and Stoltz et Fils; but, amongst moderate-sized instruments, that which has pleased me the most is a very beautiful organ made by Cavaillé-Coll, of Paris. It will be found in the chapel, out in the park. The organ in the Church of St. Sulpice, reputed to be the finest in Paris, was built by this firm; and I think that, for its size, the small instrument now exhibited may be pronounced a chef-d'œuvre. Its chief beauties lie in stops such as the "voix céleste," "voix humaine," "viole de gambe," and so forth; but it is not alone in this, so to speak, ornamental work, that the instrument excels; it is, in all points, a rich-toned and well-voiced organ. Its price is 600*l.*, and I do not consider it a dear instrument.

Austria has contributed one pleasing-toned organ, built by Hesse, of Vienna.

England furnishes two instruments, one by Messrs. Bryceson Brothers, and the other by Messrs. Bevington and Sons. The first named is styled a "mediæval Gothic organ." The woodwork of the case is stencilled, coloured, and gilded, and the front pipes are illuminated in colours and gold. Its dimensions are 30 ft. 9 in. high, 8 ft. 6 in. at the base, 14 ft. wide over the upper part of the front, and 5 ft. 6 in. deep. The summary of its musical composition is as follows:—

MR. CLAY
ON MUSICAL
INSTRUMENTS.

English
organs.

Swell organ	-	-	6 stops	-	326 pipes.
Great organ	-	-	8 „	-	448 „
Pedal organ	-	-	2 „	-	58 „
Couplers	-	-	6 „	-	— „
				<u>22 stops.</u>	<u>832 pipes.</u>

Three composition pedals to great organ; two composition pedals to swell organ.

It will be seen that Messrs. Bryceson have been somewhat limited as to space, and I consider that, having regard to this fact, the organ which they have sent reflects the very highest credit upon them; the instrument is admirably well voiced, and its general tone is rich and sonorous. The price is 850*l*.

Messrs. Bevington deserve a special word of commendation for the "Chancel Organ," which they exhibit; its price is 80*l*., and I consider it a marvel of cheapness. Its stops consist of an open diapason, stopped diapason, principal, claribel, dulciana, and bourdon. It has twelve pedals, C to G, and, being good in its tone and elegant in its external appearance, I think that Messrs. Bevington may justly claim great credit for the instrument which they exhibit.

These organs are the only two contributed by England, and it is to be regretted that specimens of the workmanship of Messrs. Gray and Davison, Hill, Walker, Foster and Andrews, and other eminent manufacturers should be absent.

From the organs we turn to the

HARMONIUMS.

As was the case with the pianofortes, the most plentiful contributor is France.

The chief exhibitors are MM. Alexandre, Mustel, Debain, Christophe, Richard, Rodolphe, and Fourneaux; and the most abundant manufacturer is M. Alexandre: his trade with England alone is immense. He exhibits many instruments, and the specimens he has sent are undeniably excellent. One

M. Alexan-
dre's harmo-
niums.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

MM. Mustel's harmoniums.

Mr. Dawes' melody attachment.

of his harmoniums in the French section has been fitted up with pedals, the action of which is specially convenient, and operates in the following manner:—After the pedal has been pressed down it may be relinquished by the foot, and the note will still continue to speak. When another pedal is required, however, the mechanism which opens the second note causes the first to cease sounding. The price of this instrument is 6000f. For this invention M. Alexandre has taken out a patent. Harmoniums of all kinds and dimensions are standing in his name; but his instruments, excellent as they unquestionably are, have the fault which I can only presume is incidental to all harmoniums. I allude to a certain “reediness” of tone in the percussion, which not only runs the risk of becoming monotonous, but causes the stops, which are avowedly reed stops, to stand out with less prominence than they otherwise would. This fault may, to my thinking, be also found with the instruments exhibited by MM. Mustel. With regard to MM. Mustel, however, I am free to confess that I think that they have furnished the best harmoniums in the Exhibition. Their instruments *à double expresssion* may be commended in the highest degree; and I must here take occasion to allude to an improvement patented by W. Dawes, of Leeds, and adopted by Messrs. Mustel, which I consider of the very greatest value. It is known as the “melody attachment,” and its effect is to give a perfectly clear and distinct additional melody, or, in other words, additional tones to the melody, with power and variety in proportion to the number of melody stops employed, thus producing the effect of one or more solo instruments being used in addition to the full harmony of the accompanying portion of the instrument. The manner in which the “melody attachment” acts is as follows:—It causes the upper note played upon the keyboard to silence (in the melody stops) all notes below itself so long as it constitutes the melody, and to restore or allow the sounding of the notes below itself when it has ceased to constitute the melodic subject. In fact the possession of this stop (the management of which, by-the-way, is of the simplest description) renders a second row of keys for all intents and purposes unnecessary. As I have said before, I find that one of the chief faults with which the harmonium can be reproached is its monotonous character. With this stop, however, the subject stands out with such prominence that this disadvantage is in a great measure lost sight of.

M. Debain has sent some excellent instruments. One of his specimens is a fine, rich-toned, and powerful harmonium; and another may be specially commended for the unusual

sweetness of its *musette*, *harpe æolienne*, and *céleste* stops. I believe that M. Debain was the first to start the commerce of these instruments in France. I am of opinion that his best harmonium is to be found in the chapel.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

MM. Christophe, Richard, Rodolphe, and Fourneaux have all contributed good instruments; but I think that the three firms to whom I have first drawn attention have obtained the most satisfactory results.

Mr. Kelly exhibits six harmoniums. They are admirable, even-toned instruments; and, both in capability and construction, will bear comparison with any others in the Exhibition. The special feature of these instruments consists in a new system of swell, whereby a more gradual effect is obtained than has heretofore been the case. Mr. Kelly states that an unequal pressure of wind upon the bellows causes not unfrequently the rupture of the reeds, but that, by reason of the general and gradual distribution of air effected by his system, such a danger would be avoided; Mr. Kelly also claims notice on account of a new and effective "forte" by which an extra expression on the pedal-blowers is produced. The instruments are all excellent.

Mr. Kelly's
harmoni-
ums.

Mr. James Gilmour, of Glasgow, sends two small-sized harmoniums, the price of one being six guineas, and of the other (containing five stops and a piano swell) 20 guineas. Despite the modesty of their external appearance, there is plenty in these little instruments to repay attention. The first one may be dismissed when I have said that, for its tone and capability, it is a miracle of cheapness. In the second instrument, however, we shall find an improved system of swell, by which the sound can be increased or diminished with extraordinary ease. It seems, that "in order to gain complete power of modulation, a box is placed over the reed-chest, fitting closely, so that the sound is as effectively confined as if the instrument were shut into another room; in the top of this box two openings are cut and valves or lids placed over them; these covers have arms attached to them, which, being made to turn on a bridge and projecting over the action towards the back of the instrument, the full power of the sound may be obtained by pressing down the extreme ends of these arms and so opening the lids or covers which confine the sound. Part of Messrs. Gilmour's patent is for connecting these arms with the wind reservoir by means of an elastic cord, so that when a moderate supply of wind is used, the covers remain closed; but as it (the reservoir) expands, the elastic cords open the covers, and thus produce a most perfect swell."

Mr. Gil-
mour's har-
moniums.

Improved
system of
swell.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

I am sorry to learn that Mr. Gilmour's instruments could not be inspected by the jury. It appears that the first specimens forwarded by him were entirely destroyed in transit; and before it was possible for him to repair the misfortune and send the instruments now on view the jury had completed their deliberations and made their awards. Mr. Gilmour's harmonium appears to me also to be decidedly less reedy in its general character than the ordinary run of instruments; and, altogether, I am of opinion that the two specimens contributed are in the highest degree creditable to his firm.

Mrs. Read has also a harmonium in the English section which is chiefly noticeable on account of the application to the keyboard of a novel chromatic system, the object of which is to facilitate the acquirement of harmony, as well as to enable the performer to transpose music at sight.

WÜRTEMBERG.—In this section we find some capital harmoniums, contributed by Messrs. Schiedmayer and Trayser, both of Stuttgart; the former has a large instrument, price 1,180f., and also a smaller one, price about 8l., both of which can be highly commended.

PORTUGAL has sent a good instrument, manufactured by Carvalho, price 1,000f.

Messrs.
Mason and
Hamlin's
"cabinet
organs."

Their patented improvements.

UNITED STATES.—Messrs. Mason and Hamlin are here the representatives; they have sent some excellent instruments, styled "cabinet organs." As the name indicates, these instruments differ in many points from the harmonium, albeit the external appearance is the same. The improvements for which Messrs. Mason and Hamlin claim credit are as follow:—An automatic bellows swell (patented); self-adjusting reed valves (patented); noiseless safety valves, for the prevention of the hissing sound heard in many instruments; and the improved combination register, which gives great facility for drawing and closing the stops. One of these instruments is fitted with pedals (price 120l.), and I think very highly of it. It is both powerful and agreeable in tone, and has less of the reediness to which I have before alluded than any other instrument of the kind in the Exhibition.

It will be seen from the foregoing remarks that the collection of harmoniums is extremely good. M. Alexandre is by far the most abundant manufacturer; and this fact, together with the undeniable excellence of his instruments, may have led the jury (as I am informed) to award him the highest honour. M. Mustel, however, does all his own work, and cannot probably turn out more than 20 instruments in the year. His work, be that as it may, is of the

highest order ; and, as I said before, I consider that the best harmonium in the Exhibition stands in the name of M. Mustel.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

STRINGED INSTRUMENTS.

We shall find that some very good violins, tenors, and basses of modern construction have been contributed to the Exhibition ; France, Belgium, Austria, the United States, and Italy, have all sent specimens of their workmanship. In France we shall find the names of Vuillaume, Gand et Bernardel, Miremont, Mennegand, Granjon, Jacquot of Paris, and Jacquot of Nancy, &c. The name best known in connexion with this branch of musical manufacture is J. B. Vuillaume, of Paris. It will be found that he has sent some very excellent instruments to the Exhibition. His model is Straduarus, and, in appearance, it must be owned that there is but little fault to be found with the instruments he exhibits. They are shapely and handsome fiddles, and assuredly nothing has been neglected in order that they should, as far as possible, resemble the great model upon which they have been constructed. In tone they are smooth and pleasing ; but I cannot think that they afford so much promise of future excellence as other instruments about which I shall speak later. M. Vuillaume exhibits a self-acting sordino, or mute. It is a very simple mechanical contrivance attached to the tail-piece of the fiddle, and a slight pressure of the chin is all that is required effectually to deaden the vibration of the strings.

M. Vuillaume's modern violins.

M. Miremont has sent some good-looking instruments. They are, to my thinking, chiefly noticeable for their admirable varnish. It appears that M. Miremont has made this branch of violin manufacture his especial study. I do not much fancy his tenor, which appears to me somewhat deficient in the true tone of the alto, nor his bass, which is not so free in sound as it might be ; but his violins are handsome and fair-toned instruments.

M. Miremont's violins.

MM. Gand et Bernardel have, in my opinion, sent the best modern stringed instruments that are to be found in the Exhibition. They are red, gaudy-looking fiddles, with no pretension to appear older than they are ; but their tone is wonderfully free, and they possess great power and sonority. They are admirably modelled ; and I have no doubt in my own mind but that, when time has put all the new instruments to the test, MM. Gand et Bernardel will be found to have turned out the best examples. The other exhibitors who deserve commendation are MM. Mennegand and Granjon.

MM. Gand et Bernardel's violins.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

In the Belgian section we shall find that Vuillaume (of Brussels) has sent some good specimens; his violoncello (model of Straduaris) is a good-looking and pure-toned instrument. Of the examples furnished by M. Darche (also of Brussels) I do not think so well.

Austria is represented by Bittner, of Vienna; Prussia, by Grimm, of Berlin; Bavaria, by Haslwander, of Munich (who has taken both Straduaris and Guarnerius for his models), Reiter, of Mittenwald, and others.

Italy has numerous representatives; but I think that Ceruti, of Cremona, for violins, and Guadagnini, of Turin, for tenors and basses, have sent the best specimens.

In the American section we shall find some moderate instruments, furnished by Gemünder, of New York. The model of Straduaris has been adopted; but, although the examples are fairly attractive in external appearance, I cannot say that the instruments took my fancy.

I am informed that the jury have awarded the highest honours to M. Miremont.

INSTRUMENTS of WOOD.

Flutes and
piccolos.

The best piccolos, flutes, oboes, clarinets, and bassoons have been sent by French and Belgian manufacturers, and, as a general rule, the specimens exhibited are entitled to high commendation. We will begin with the piccolos and flutes; and we shall find that MM. Thibouville aîné (of Paris), Bié (of Paris), Coche (of Paris), Albert (of Brussels), Buffet-Crampon et Cie. (of Paris), and Rothe (of Paris), have sent some admirable instruments. M. Breton (of Paris) exhibits a piccolo made of green crystal; it possesses a wonderfully pure and bright tone. The piccolos which pleased me most, however, are those made by MM. Buffet-Crampon et Cie. and Thibouville aîné; they are excellent instruments.

With regard to the flutes, I think that those contributed by Coche (of Paris), Albert (of Brussels), and Lot (of Paris) are the best; whilst the instruments standing in the names of Thibouville aîné, Leroux, and Gautrot may also be commended.

Oboes and
CorsAnglais.

I think that the finest oboes have been exhibited by Messrs. Triébert, of Paris, and Albert, of Brussels. Both firms can be praised unreservedly. M. Albert's oboe is a fine, level-toned instrument, possessing a compass from A below the stave to G on the leger line above. M. Leroux also contributes a charming oboe. The instruments sent by Ziegler, of Vienna, and Lausmann, of Vienna, do not please

me so much. On the whole, I think that M. Triébert has obtained the best result. He has, moreover, sent a very beautiful cor Anglais. M. Leroux's cor Anglais is also a delightful instrument, but perhaps somewhat less powerful than that of M. Triébert.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

Amongst the contributors of the best clarinets should, I think, be ranked MM. Buffet-Crampon et Cie.; Albert, of Brussels, and Romero, of Madrid. In the clarinet sent by Albert it appears to me that, by his new arrangement for the simplification of the fingering of accidentals, the necessity of changing the instrument from A to B flat or C is diminished, and may in time be obviated. The instruments sent by MM. Buffet-Crampon, consisting of clarinets, a corno di bassetto, and a bass clarinet, are also entitled to the highest commendation; their E flat soprano is about the best of the soprano clarinets in the Exhibition. The clarinet contributed by Romero is a sonorous and altogether admirable instrument. M. Buffet jeune, in addition to a first-rate corno di bassetto and bass clarinet, has sent a transposing clarinet, which, by a mechanical action, can be shifted from A to B flat and C with perfect ease; this is assuredly an invention of much importance to clarinet players. MM. Mahillon (of Brussels), and MM. Thibouville et Beranger, and Thibouville Lamy (both of Paris), together with Lot, Leroux, and Gautrot, &c., have also sent admirable specimens. Altogether the exhibition of clarinets is in the highest degree creditable. I may mention that nearly all these instruments are fashioned after Klosé's system, a system which appears now to have gained almost universal acceptance.

Clarinets.

In speaking of the bassoons, I think that M. Triébert must again be placed at the head of the list; the instrument which he exhibits is very beautiful, and possesses certain improvements, the value of which can scarcely be overrated. Amongst other advantages, it may be mentioned that on this bassoon the low notes, even down to B flat, can be sounded *pianissimo*; again, the shakes from D to E flat, from E flat to F, from the upper G sharp to A, and from A to B flat, which have hitherto been found so awkward to finger, are now rendered perfectly simple. When I add that this bassoon possesses a rich and even tone in all its registers, it will be seen that the instrument well deserves commendation. M. Gautrot also has sent a first-rate bassoon, and so has Albert of Brussels. The other specimens exhibited stand in the names of Herr Ziegler and Herr Lausmann. I do not think very highly of the instruments sent by either of these firms.

Bassoons.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

In conclusion, I may say that the collection of wood instruments in the Exhibition is of the highest excellence.

BRASS INSTRUMENTS.

In treating of the brass instruments I find myself in a position of some difficulty, partly owing to the great number of objects on view, and partly because the improvements and mechanical contrivances which call for notice are in some instances of so complicated a character as to render it almost impossible for me to afford an adequate description of them without entering into details which would carry me further than the space at my disposal will admit.

M. Sax's
brass in-
struments.

We shall find that France has again contributed the greatest number of instruments, and we will begin with M. Adolphe Sax. He exhibits every form of instrument, from the E flat cornet down to the B flat contrabass, and the specimens he sends are of the highest merit. I should fancy that the instruments on which he sets the greatest value are his six-pistoned trombones, and they are undoubtedly the best instruments of their class which I have ever heard. He has also sent a good bugle, a French horn (à pistons) of pleasing and even tone, some good baritones, and excellent basses. A trombone with no less than seven bells will also be found in his collection. The advantage which this instrument has to offer in compensation for its cumbrous character is that each tube contains its own group of notes, and that natural tones can be obtained where, in other instruments, the use of the piston would be necessitated. M. Sax exhibits a trumpet with six pistons, which may be commended. I should here observe, however, that there is not one pistoned trumpet in the Exhibition which I can honestly say I like. No doubt they are cleverly made instruments. The player can run up and down scales, and achieve all manner of results which, with the old-fashioned instrument would be impossible; but these facilities are acquired at the expense of the silvery brilliancy which is the true tone of this instrument, and which I have never yet found in a pistoned trumpet. The same remark, though to my thinking in a lesser degree, will apply to the French horns. With regard to horns, I think that the best instruments of this class have been sent by M. Besson; they are round in tone and true in intonation. His cornets are very good; and he has some double-slide trombones, on a new model, which are excellent. The instruments of low register standing in the name of Besson are perhaps not so good as those of other exhibitors; but the collection is more than

M. Besson's
brass in-
struments.

creditable, and I think that nearly all the instruments contributed by the firm may be characterized as being easy to blow, and as possessing a smooth, if not always brilliant, quality of tone.

MR. CLAY
ON MUSICAL
INSTRUMENTS.

MM. Lecomte, Labbaye, Martin, and Millereau (of Paris), with M. Roth (of Strasburg), and M. Mahillon (of Brussels), are entitled to great credit for the general excellence of the brass instruments of all classes which they have forwarded.

M. Antoine Courtois has turned out some altogether first-rate instruments; I think that the cornets standing in his name are the best in the Exhibition. I may draw special attention to a B flat baritone, which, for roundness of tone and truth of intonation, is as good as any instrument of the class I ever heard. M. Courtois has adopted an invention for the cornet, patented by M. Legendre, whereby the key of the instrument is transposed from A to B flat with perfect ease, at the same time that the piston slide is adjusted to the proper position.

M. Courtois'
brass in-
struments.

I now come to M. Gautrot, the specimens of whose workmanship deserve great attention. He is the inventor of the system known as the equitonic system, by which a true intonation in the lower notes of the instruments is obtained. I regard this invention as one of the most important improvements which has been made in modern days in connexion with brass instruments, inasmuch as a perfect intonation in the lowest register has, until M. Gautrot invented his system, been found well nigh impossible. I will endeavour to indicate the principle of this invention in a few words, and will take as an illustration a bass saxhorn in B flat and F. It will be seen that this instrument is furnished with three pistons, in the usual position, and two others at the side, worked with the left hand, which we will number 1 to 5, and with three columns of air. The fourth piston being pressed down opens the second column of air in connexion with the first three pistons, and lowers the notes one fourth. The fifth piston opens the third column of air, lowers the instrument by a major third, and the other notes produced by the three first pistons by a minor sixth. The three first pistons are always tuned according to the ordinary system, so that the player unused to the equitonic system can treat the instrument as though he were playing the ordinary four-cylinder bass, until he has mastered such difference of fingering as the new system demands. It is evident, in addition to the advantages which this system offers in the matter of intonation, that an accession to the compass of the instrument is obtained. M. Gautrot's specimens are, in many

M. Gautrot.
His equi-
tonic system.

MR. CLAY
ON MUSICAL
INSTRU-
MENTS.

The Sarru-
sophone.

cases, of very great excellence and of unusual cheapness. It must be understood that the last-mentioned quality does not attach to the equitonic system, which entails some additional expense on the cost of the ordinary instrument. M. Gautrot also exhibits some instruments styled Sarrusophones, which in form resemble clarinets and bassoons. They are made in metal, and are blown through a double reed; their registers range from the soprano in E flat to the contrabass in B flat, and the last-named instrument will give the *octave below* the double A flat; in fact, the 32-ft. pipe of the organ. The sarrusophone is designed to take the place of wooden clarinets and bassoons in brass bands; and, inasmuch as its carrying power is much superior to that of the instruments now in use, I conceive that its employment would clearly be advantageous.

Mr. Distin's
brass in-
struments.

Mr. Distin, of London, has sent some splendid specimens of his well-known workmanship. The instruments he exhibits are all entitled to commendation; but I think that, as a rule, those of low register are most deserving of attention. His baritones, basses, and contrabasses are in the highest degree admirable. I may observe that he has adopted M. Gautrot's equitonic system. Mr. Distin has sent two capital bugles, clear toned and not shrill. He has also sent some good cornets. With regard to the latter, I should call attention to the application of a separate double valve for the purpose of letting the water out of the instrument. This improvement is invented and patented by Mr. Distin.

The United States are represented by Messrs. Schreiber and Metzroth, both of New York, and Mr. Wright, of Boston. I cannot say that I greatly fancy the instruments they have sent.

In the Austrian section we shall find the names of Messrs. Bock, of Neu-Lechenfeld; Cervený, of Königgratz; Tomschik, of Brünn, in Moravia; and Ziegler, and Lausmann, of Vienna. The trumpets, bugles, horns, &c., are of average merit; but the trombones, baritones, bombardons, &c., are, in some cases, of unusual excellence. I think that the best results have been obtained by M. Cervený.

Spain is represented by M. Auger, of Barcelona.

Objections
to the exclu-
sive employ-
ment of
pistoned
instruments
in the
orchestra.

It will be seen from the foregoing remarks that I have spoken in laudatory terms of some of the instruments à pistons which I have passed in review; nor could I do otherwise, for, viewed as evidences of musical mechanism, the specimens sent to the Exhibition are well deserving of praise. Still I cannot but regard as a serious evil the introduction of pistoned instruments into the orchestra, whether it be for the concert-room or the theatre. It is true that in their

employment the artist will find that the difficulties which he has had to contend against in dealing with an imperfect instrument, are partially if not wholly removed, whilst to the composer will be afforded a latitude which he could never have enjoyed in writing for the old-fashioned instruments.

These tempting facilities are, however, acquired at a ruinous cost; no less a one, indeed, than the loss of that well-defined colour in the tone of brass instruments which is so dearly prized by the composer. Each one of these pistonated instruments, taken singly, may pass muster, but I feel satisfied that when many of them are heard at once, and in conjunction with a stringed band, such slender individuality as each may possess will be lost, and the effect obtained will be that of a family of brass, bearing signs of their common descent, and resembling each other in all things save the register in which they are being played.

In concluding my remarks on this first-rate collection of brass instruments, I may mention that I have been given to understand that the jury have thought it right to award the first prize to M. Adolphe Sax. It will be judged from what I have written that I think it no easy matter to decide between the merits of firms who, in their respective lines, have exhibited objects of the first excellence. MM. Gautrot, Courtois, Besson, and Distin are all entitled to the highest commendation.

PERCUSSION.

Amongst the drums we shall find some capital kettle-drums made by Martin, of Paris, one of which, with nine screws for tuning, is quite excellent. M. Gautrot sends a drum which can be tuned with one screw. It is made of brass instead of copper, and, having regard to its price (*viz.*, 250*f.*) and its admirable sonority, there can be no doubt but that it deserves the greatest praise. An exceedingly handsome pair of drums will be found in the Italian section, which have been sent by Giuseppe Galleotti, of Cremona. M. Grégoire, of Paris, has sent a capital little side-drum, called the *tarole*.

I find that I have made no mention of concertinas, as I have not known where to class them; perhaps I should have spoken of them after the harmoniums. The only concertinas in the Exhibition are to be met with in the English section. They are exhibited by Mr. Lachenal, of London, and, constructed as they are on the model of Wheatstone's instruments, they may be pronounced excellent. They are, moreover, admirably got up in point of external appearance.

Concertinas.

MR. CLAY
ON MUSICAL
INSTRUMENTS.
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I shall now draw attention to certain instruments which, as they do not form part of the legitimate catalogue, so to speak, of musical instruments, have not as yet been alluded to.

Musical
boxes.

In the Baden section are to be seen some musical boxes on an enormous scale, styled orchestrions. The Germans have always been held to be pre-eminently successful in this branch of musical manufacture, and I should fancy that such ingenuity and elaborate musical mechanism has rarely been seen as in these instruments. The chief exhibitors are Herr Kelsen, Herr Welte, of Noehrenbach, and Herr Zaehringer, of Furtwangen, and their orchestrions are, beyond doubt, great curiosities.

M. Mustel's
tuning
forks.

Attention may be drawn to an instrument composed entirely of tuning-forks, which is exhibited by M. Mustel, and will be found close by his harmoniums. M. Mustel does not pretend that this instrument has as yet any musical significance; he designs it as an experiment only, and, viewed in this light, it must be owned that a sound more bright and silvery than that which proceeds from these tuning-forks could scarcely be conceived.

Oriental in-
struments.

In Turkey, Morocco, Tunis, &c., will be found musical instruments which possess interest other than that derived from musical excellence only; in fact, as artistic results they may not be ranked high. They consist for the most part of instruments of the flute and oboe class, of lutes, mandolines, drums, and cymbals. I am surprised to find an almost entire absence of the violin species, by which I mean a stringed instrument sounded by means of a bow. I must not forget to bear tribute to the merits of some cymbals, which will be found in the section of the Ottoman Empire; they are in the highest degree brilliant, and possess the true metallic ring which is not always heard in cymbals. Without entering into details regarding the dates and history of these various instruments, there is not much to be told that would possess any general interest; I will merely say, therefore, that the collection, viewed as a curiosity, is one of the greatest value.

Music
printing.

Before concluding this report, I should wish to say a few words respecting some of the specimens of music-printing which are to be found in the Exhibition. Amongst the English exhibitors we find the names of Messrs. Ewer, Chappell, Augener, Cramer, Boosey, Novello, and others. I consider that the first four, in the order I have named, have produced the best results. In France we shall see contribu-

tions from Gerard and Co., Escudier, Lemoine, Brandus, Hengel, Maho, Colombier, &c. Gerard has brought out "Solomon," "Israel," and other works by Handel; the editions are well got up and the printing is clear and good. M. Escudier is the exclusive publisher of nearly all Verdi's operas, whilst M. Brandus has the monopoly of Meyerbeer's works; the engraving of both publishers seems to me of about the same average value. The best music-printing in the French section is, in my opinion, that contributed by M. Lemoine. He has brought out some sonatas of Beethoven, *gravée sur zinc et imprimée en taille douce*; these specimens are admirable.

MR. CLAY
ON MUSICAL
INSTRUMENTS.
—

In Spain we shall find the name of M. Romero, of Madrid, whose printing deserves high commendation; it is excellent. M. Eslava, also of Madrid, has sent some good music-engraving, but by no means so good as that furnished by M. Romero.

At the head of the list of musical publishers, however, must indubitably be placed the names of Messrs. Breitkopf and Härtel, of Leipsic. This firm have long enjoyed the highest reputation, and no one can see the editions of Beethoven, Bach's "Passions Musik," and other specimens which they exhibit without admiring the bold, free type, and general excellence of their work.

I have now, to the best of my ability, passed in review the different musical objects which appear to me to claim attention. It has been my endeavour to judge the merits of the different exhibitors by one general standard of excellence rather than by a system of absolute comparison—a system, by-the-way, which for our purpose would have been not only invidious but unsatisfactory. As I said at the beginning of my remarks, it is not to be expected that purely novel inventions can be frequently forthcoming in the present day; but the collection of musical instruments in the Exhibition must be pronounced to be of the highest interest, whilst there is much—very much in it of superlative excellence.

Conclusion.

REPORT ON MEDICAL and SURGICAL INSTRUMENTS and APPARATUS.—(Class 11.)—By Sir J. F. OLLIFFE, M.D.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &c.

It is no easy matter to compress into a limited space a description of the various objects relating to the medical sciences, sent from all parts of the world to the Universal Exhibition.

In the present notice we shall confine ourselves to a brief sketch of these objects, reserving for a subsequent and lengthened report observations and descriptions we have not room for on this occasion.

Our present aim is to enable the English medical and scientific visitor to take a complete though rapid view of the articles comprised in Class 11. We propose to conduct him through each country in its turn, and to call his attention to the various articles in the following order:—

1, Surgical instruments, properly so called ; 2, hydropathic and hydrothermal apparatus ; 3, trusses, bandages, artificial limbs ; 4, artificial teeth, instruments for dental operations, including prothesis ; 5, pathological specimens in wax ; 6, instruments in india-rubber and vulcanite ; 7, artificial eyes ; 8, medical stationery, typography, and engravings ; 9, syringes, feeding-bottles, &c. ; 10, miscellaneous, such as furniture, chairs, beds, gymnastic apparatus, &c.

To facilitate the complete view of the exhibits of Class 11, we must explain that all the articles in this class which are inside the building are placed in Gallery 2, called “Galerie des Arts Libéraux.”

On entering by the Porte de la Bourdonnaye, and beginning with France, we shall view in succession the contributions of the following countries:—Holland, Belgium, Prussia, Baden, Wurtemberg, Switzerland, Spain, Portugal, Denmark, Sweden, Norway, Russia, Italy, the States of the Church, Turkey, Egypt, the United States, Brazil, and lastly, England.

On turning to the left, from the Rue de France into the France. Galerie des Arts Libéraux, we find on each side the French courts of Class 11. In the court on the left are the cases of Messrs. Wickham, Robert and Collin, Luer, Capron, and others.

Messrs. Mathieu's collection is decidedly one of the most remarkable in the Exhibition ; their various instruments, the perfect workmanship, and the excellence of their materials having attracted universal approbation. We regret we can-

Surgical
instruments.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &C.

not devote more than a simple mention to many of these, but we beg to direct particular attention to the ingenious modifications of Leroy d'Etiolle's instruments for extracting foreign bodies from the cavity of the bladder (fig. 1), by which they

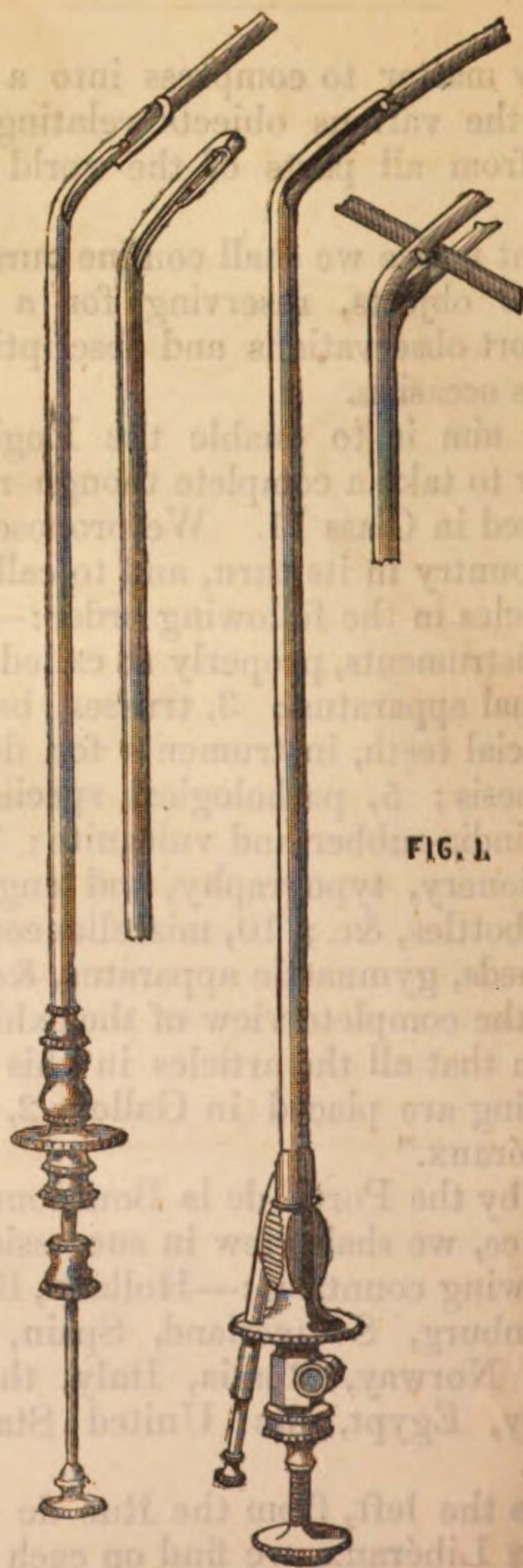


FIG. 1.

LEROY D'ETOILLE'S INSTRUMENT FOR EXTRACTING FROM THE BLADDER.

are seized and brought into the axis of the instrument itself, and thus removed without difficulty; to an instrument for *écrasement linéaire*, as practised by Chassaignac, and, following his example, by most modern surgeons; to Néla-

ton's *brisepierre*, various pessaries, Sims's instruments for vesico-vaginal fistula, and uterine operations; to an apparatus for the transfusion of blood; to Follin's eye douche (fig. 2);

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &c.

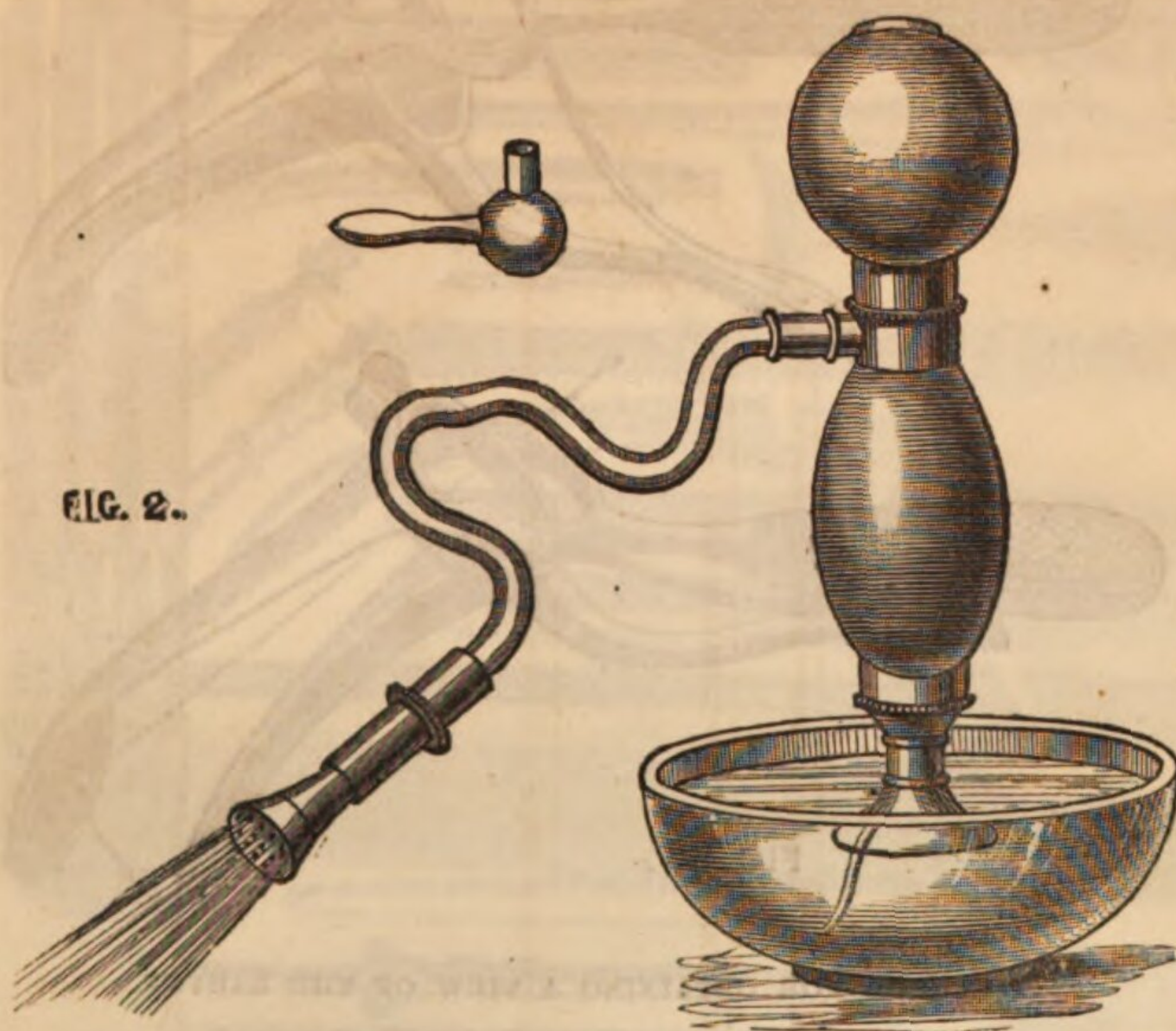


FIG. 2.

FOLLIN'S EYE DOUCHE.

to a small *écraseur* for polypi in the larynx; to a polypotome for the same usage (fig. 3), very ingenious; also, to an intra-



FIG. 3.

POLYPOTOME FOR CUTTING AWAY AN EXCRESCENCE IN THE LARYNX.

uterine speculum; to a hydrofère, for acu-puncture; to another hydrofère, for the pulverisation of liquids; to an amygdalotome scissors for extirpation of the tonsils with one hand; to Labordette's laryngean speculum, by which a complete view of the interior of the larynx may be obtained

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRU-
MENTS, &C.

(fig. 4) ; to a great variety of splints in wood, metal, and

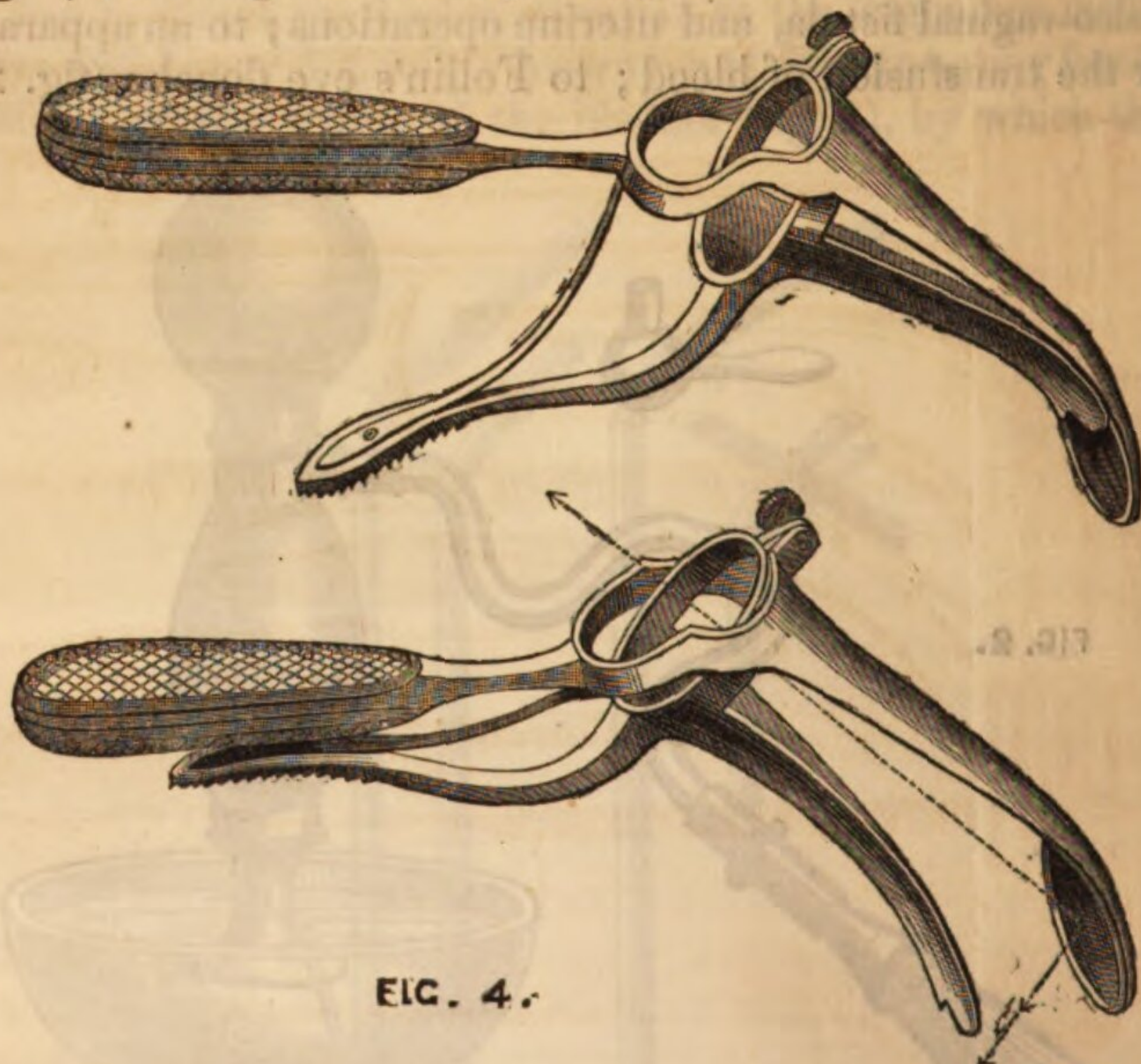


FIG. 4.

SPECULUM FOR OBTAINING A VIEW OF THE LARYNX.

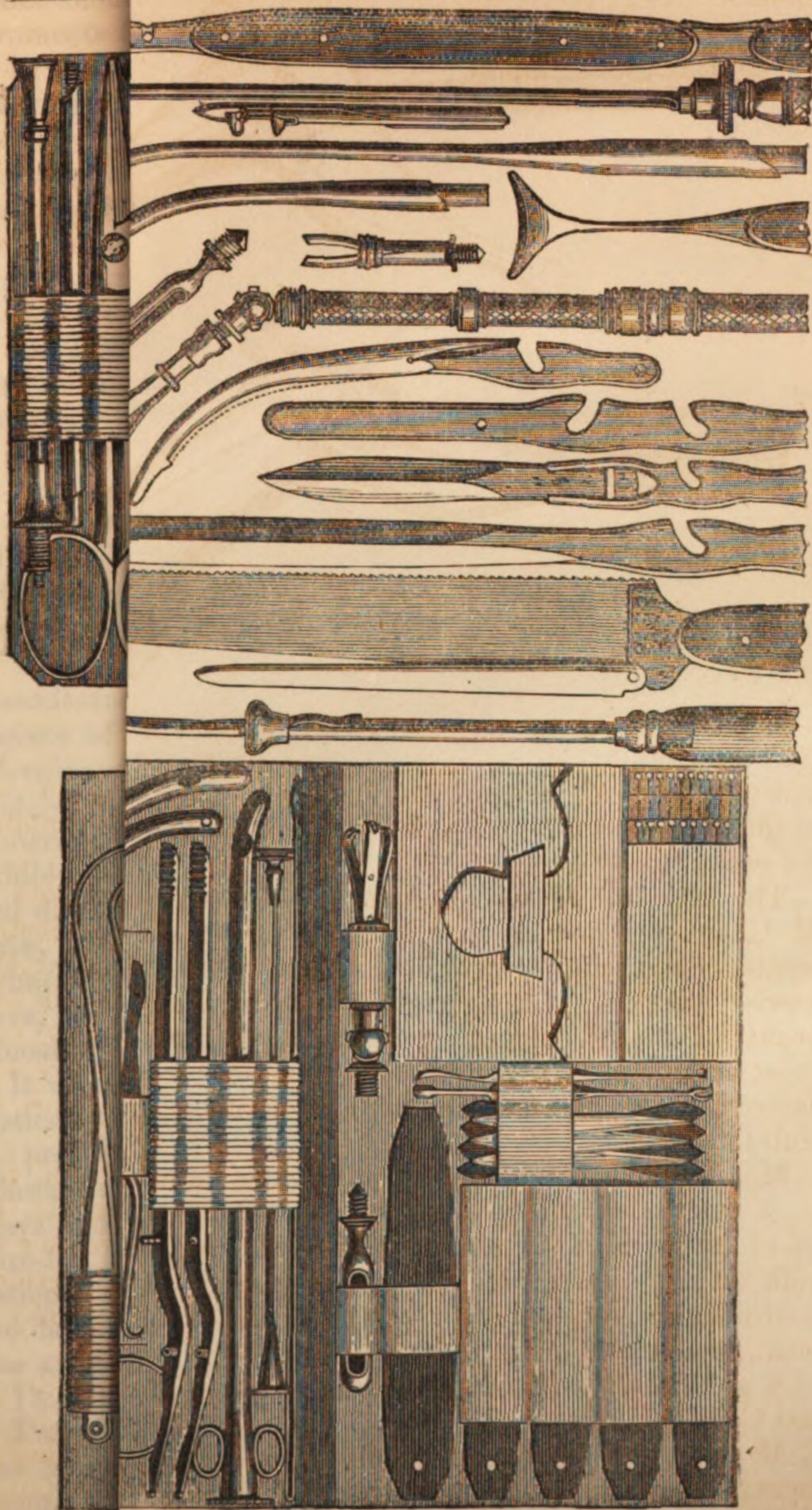
wire; to surgical instruments for continued extension, and to the artificial limbs, &c. M. Mathieu's collection obtained the *grand prix d'honneur*.

The case of Messrs. Robert and Collin, successors to M. Charrière, contains an infinite variety of surgical instruments, of the same description as those of M. Mathieu, and nowise inferior. Amongst them may be instanced a very beautiful case of ophthalmic instruments, various specula, a great variety of corsets, and other appliances for correcting deformities; apparatus for the reduction of luxations, for club-foot, &c.

M. Charrière is the inventor of articulated blades, that is, a system of blades adapted to a common handle, the effect of which is to diminish the price and to reduce the bulk of the cases. In the illustration of M. Charrière's instrument cases several of these articulated blades may be seen (fig. 5).

A gold medal was awarded by the jury to Messrs. Robert and Collin.

M. Luer's case contains a remarkable collection of instruments; those for lithotomy attracted the special attention of the jury. Amongst others we may mention apparatus for phymosis, tracheotomy, cephalotribes, and many others.



2. HANDLE.

The first of these is the fact that the

The first of these is the fact that the

The cases of Messrs. Capron, Guéride, Vitry, and Grand-collet should be visited, as well as the very remarkable instruments for veterinary surgery exhibited by M. Mericaut.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &c.

In the hydropathic and hydrothermal department, M. Charles's apparatus merited the highest commendation of the jury, as being conspicuous for their workmanship, their extreme variety, and their utility. His douches—circular, horizontal, and vertical—may be seen in full play in the park, near the Porte de l'École Militaire, and will well repay a visit. A gold medal was awarded by the jury to M. Charles.

Hydro-
pathic and
hydro-
thermal ap-
paratus.

Dr. Lefebvre exhibits an ingenious apparatus for administering vapour baths to patients without moistening their bedding.

Mr. Wickham exhibits a collection of bandages, trusses, and orthopædic apparatus, all of which received favourable notice from the jury; and in the same rank may be placed Messrs. Fichot, Béchard, Charbonnier, and Biondetti. M. Flamet's elastic tissues occupy a prominent place. He was one of the earliest manufacturers of such tissues in France.

Bandages,
trusses, &c.

We next come to consider dental surgery, including the manufacture of teeth and dental operations. In the manufacture of teeth the French are entirely deficient, scarcely affording a specimen worthy of mention, the palm being completely carried away in this branch by the English and Americans, of whom more hereafter. One example, however, exhibited in the French department stands out conspicuous, and deserves particular mention. It is the case of M. Preterre, a surgeon-dentist of eminence in Paris, who, though living in France and exhibiting as a Frenchman, is, we believe, an American by birth, and received his professional education in that country.

Dental sur-
gery.

It would be impossible for us in this short space to do justice to his really great performances in dental surgery and in prothetic operations for the correction of deformities, whether congenital or acquired. His extensive *vitrine* displays the results obtained by him in cases of cleft palate, hare-lip, restoration of maxillary bones, &c., on casts of patients, addressed to him by the most eminent surgeons of the day, such as Nélaton, Velpeau, and others. A gold medal was awarded to M. Preterre.

Dr. Crane's porcelain teeth deserve to be noticed.

Pathology.—Amongst the pathological specimens in wax, the magnificent collection of Vasseur will well repay an examination. He has imitated nature to the utmost perfection. The diseases of the skin were taken principally from the Hôpital St. Louis. This *vitrine*, on account of the

Pathological
specimens.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRU-
MENTS, &c.

Caoutchouc
instru-
ments.

nature of the objects delineated, is concealed by a curtain, and is situated in the same court as Charles's hydropathic apparatus. M. Vasseur has obtained a gold medal.

Amongst the instruments of india-rubber and vulcanite, the collection of M. Galante occupies the very first place. He has applied india-rubber to every branch of surgery. Catheters of all sorts, inhalers, acoustic apparatus, crutch cushions, the "insufflateurs" (small instruments for blowing powder into cavities, particularly the throat and vagina), excel in his collection. To him belongs the merit of introducing into France the water bed, the invention of which is due to Dr. Arnott, and which, although exhibited by that gentleman in Paris, in 1855, remained almost unknown in France up to a very recent period. M. Galante obtained a gold medal.

There are also many other interesting articles in caoutchouc to be observed in the French department, as well among the general collections of surgical instruments as among the special ones. Of the latter I cannot pass unnoticed the *vitaines* of Messrs. Leplanquais and Galibert. These two last are remarkable for the extreme lowness of their prices.

Artificial
eyes.

The collections of artificial eyes, by Messrs. Boissonneau, father and son, Pilon, and others, are extremely interesting. Though the celebrated optician M. Nachet has met with due reward in another class, his ophthalmoscope and other instruments constructed under the direction of Dr. Emile Javal came under the notice of the jury of Class 11, and was inspected by them with much interest.

Medical
stationery.

Medical stationery.—In this department M. Baillière holds the first place. We would recommend the visitor to inspect principally his anatomical figures, printed in colours; his "Archives de Médecine Photographique," by Lebert, a magnificent work, is worthy of the highest praise, as are also those of Chevreuil, Moquin, Tandon, and Rezé; N. Victor Masson's typography and engraving are also very superior. M. Asselin has likewise obtained the approbation of the jury, especially for specimens of cloth binding of extraordinary cheapness, and for his coloured typography.

Syringes, &c.

Syringes, Artificial Nipples, Feeding-bottles, &c.—In this department we would call special attention to the really rich collections of Messrs. Darbo and Thiers.

Miscel-
laneous ap-
paratus.

Miscellaneous.—M. Sax displays an ingenious apparatus for disseminating the odour of *var* in apartments, and thus sparing the patients the effort, sometimes so fatiguing, of forced inhalation. Under this head may be included the hæmo-spastic apparatus of Junod, and the electric brush of Bru,

which has been employed of late with much advantage in rheumatism and neuralgia, especially by Professor Tardieu, at Lariboisière and the Hôtel Dieu.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &c.

The gymnastic apparatus of Messrs. Burlot and Vian deserves special notice, as combining in a very small space all that is necessary for performing every species of gymnastic exercise; but the price is too high to permit of its general use, at least in private houses.

Continuing along the same gallery we enter Holland, where, we regret to say, we recognize nothing particularly worthy of notice.

In Belgium, the next in order, we find the exhibitor Genotte with a very creditable collection of eyes and teeth, Laurys with elastic tissues, and Van den Heude, whose surgical instruments are tolerable.

We next arrive at Prussia. Reim, of Berlin, is distinguished for his exhibition of surgical instruments, bandages, and orthopædic apparatus. He has also a very complete case of surgical instruments. Goldschmidt, of Berlin, exhibits the same class of articles. Lutter's exhibition of surgical instruments is interesting.

In Austria, Leiter, of Vienna, has a very remarkable case of surgical instruments and bandages, a galvano-caustic apparatus, and instruments for vesico-vaginal fistula. Mang, of Prague, exhibits surgical instruments. Reiss, apparatus for baths.

Switzerland, the next in order, shows little deserving the notice of the medical visitor.

In Spain, we would call attention to the exhibition of Chevalier's surgical instruments, and to a remarkable gymnastic apparatus exhibited by Count Aguilera de Villalobos. Pi y Masanes, of Barcelona, shows curious results in *cuir rigide*, or hardened leather. M. Clausolles has a well-furnished case containing instruments, electro-therapeutic apparatus, and artificial limbs.

The only object in the Portuguese department that seemed worthy of note by the jury was a flexible sound, by Andrade.

In Denmark, Camille Nyrop occupies a very important position. He exhibits a fine collection of surgical instruments and orthopædic apparatus.

The jury noticed, with much pleasure, in Sweden, Mr. Stille's exhibition of surgical instruments, which are of excellent workmanship and of the very best materials. Mr. Stille was recompensed in France in 1855, and in England in 1862. Amongst the instruments in his case we may mention an amygdalotome, a graduated saw for

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRU-
MENTS, &c.

post-mortem examinations, several surgical appliances, an ambulance of the low price of 500 f., and artificial limbs.

Prince Oscar of Sweden exhibits a very complete gymnastic apparatus, constructed on Ling's principles. It combines the advantages of cheapness and very great solidity.

Norway.

In Norway, Gallus exhibits surgical instruments. His lancets are of excellent manufacture.

Russia.

In the Russian Court, the exhibition of the Minister of War deserves special mention. Most of the instruments are made from French models; amongst them may be cited very complete cases of instruments for laryngoscopy, tracheotomy, ophthalmology, and obstetrics, and several vulcanite surgical instruments. We must also mention the india-rubber fabrications of the Russo-American Company, among which are some medical and surgical instruments of rare perfection. M. Schimanousky, of Kiev, exhibits a respectable case of surgical instruments and artificial limbs.

Italy.

We next come to Italy. In the Italian exhibition the Brothers Lollini, of Bologna, occupy deservedly the foremost position. Their instruments are manufactured of Sheffield steel, and are most remarkable: they employ 130 workmen. Amongst the instruments exhibited we may point out several, of the invention of Professor Fabrizzi, for the operation of lithotomy, a cephalotribe forceps, a quadri-valvular speculum, instruments for tracheotomy, ophthalmology, a pelvimètre by Beluzzi, and many others. This case is well worth inspection. Messieurs Lollini obtained a gold medal.

In the States of the Church we only find one exhibitor.

Turkey.

The Turkish exhibition is not very remarkable. We cannot, however, avoid noticing, in passing, the cases of Fayk Bey. Those of Kadi Effendi, of Cairo, in Egypt, are some of them interesting from the fact of his exhibiting steel instruments used by the Arabs and negroes.

Tunis confines itself to the production of lancets of no prominent qualities.

We next reach the United States of America.

Surgical in-
struments.

We regret that want of space precludes our mentioning, according to its deserts, the very remarkable exhibition of the United States. We cannot, however, pass without observation the surgical instruments exhibited by Dr. J. K. Barnes, Surgeon-in-chief of the American army, fabricated principally by Tieman. His plans and models of hospitals and ambulances, to which we shall again allude in the description of the International Exhibition, are well worthy of observation.

In the dental department the exhibition of Mr. S. S. White, of Philadelphia, stands conspicuous for his artificial teeth, which are used by most of the operative dentists in America, and by several in Europe. The teeth manufactured by Mr. White, and those of Mr. Ash, in London (of whom more presently), have almost entirely superseded the use of natural teeth in dental operations. Mr. White obtained a gold medal. Messrs. Johnson and Lund, of Philadelphia, were highly approved by the jury for their artificial teeth. Allen exhibits the same fabrication, and an apparatus for preventing the cheeks from falling in in thin persons. Bates, for his apparatus for the cure of stammering, and Messrs. Selfo, Marks, Weston, and Lincoln, all exhibiting artificial limbs, are severally worthy of commendation. Mr. Taylor shows a gymnastic apparatus.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &C.
—
Dental department.

Of the contributions from Brazil, the surgical instruments exhibited by M. Blanchard, a Frenchman and a pupil of M. Charrière, deserve a special notice for their variety and the excellence of their manufacture.

Brazil.

We now reach the English department. The space devoted to the eleventh class is but small, and the deficiency of England in the exhibition of surgical instruments is much to be regretted, several of our great names in that line—Weiss, Simpson, Matthews, Arnott, and Hooper—not appearing in the catalogue of 1867. Whence this absence? One exception exists—that of Messrs. Evans and Stevens, who show in the English war department a beautiful collection of surgical instruments.

England.

Surgical instruments.

Rein's collection of instruments for aural surgery is the best of all those in the exhibition. His ear-trumpets, graduated according to the degree of deafness, are very complete, and the devices resorted to to render the instruments all but invisible are ingenious. In the midst of his case is a large acoustic chair, of excellent workmanship, which is worthy of observation. Mr. Rein's case also contains an extremely good and varied collection of stethoscopes. Mrs. Rein's belts, bendages, corsets, and laced stockings are all of excellent workmanship and tissues.

Mr. Salt's bandages, abdominal belts, and trusses are of superior manufacture.

Longdon's laced stockings hold rank with the best productions of the sort.

Messrs. Ash and Sons, of London, to whom we have before alluded in describing the American exhibition, occupy a most conspicuous and creditable position in the Exhibition of 1867. The manufacture of artificial teeth has made very great progress within the last few years, and it is but just to say that

Dental surgery.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRU-
MENTS, &c.

Messrs. Ash have much contributed to this progress. Their teeth are now used by most of the eminent dentists in Europe, and by many in America; and their imitations of the various hues and colours of the natural teeth are perfect. They also exhibit instruments of dental surgery of the most varied description and of perfect execution. Their case will richly repay an examination. Messrs. Ash and Sons have obtained a gold medal. Mr. Lemale also exhibits a collection of artificial teeth.

Twinberrow's injection apparatus, feeding-bottles, &c., are very remarkable.

Miscel-
laneous ap-
paratus.

Dr. Roth's gymnastic apparatus, accompanied by an illustrated work, attracted the attention of the jury, as did also an excellent model for an ambulance hospital, with kitchen and cooking apparatus, by the same exhibitor.

Mr. Marsden has a great variety of respirators, some of which are very cheap. He also exhibits shades for the eyes.

Mr. Masters exhibits a collection of artificial limbs made of wood, of great perfection, and combining in a remarkable degree the requisite properties of solidity, lightness, and great facility of movement.

Messrs. Savory and Moore's medicine chests are of excellent manufacture, and are most ingeniously contrived.

INTERNATIONAL EXHIBITION OF MILITARY AMBULANCES AND HOSPITALS, AND APPARATUS OF ALL KINDS DESTINED FOR THE ASSISTANCE OF THE WOUNDED.

Interna-
tional Exhi-
bition of
Sanitary
Commis-
sions.

We now leave the great building and proceed to the park, where we visit the exhibition of the various sanitary committees of Europe and America, to the examination of which the jury devoted several days. It would require volumes to describe minutely this collection, unique in its nature and unparalleled in previous exhibitions, and which in itself would almost form an epitome of the history of the sanguinary wars which have occurred of late years in the two hemispheres. The compartments in which these objects are exhibited are distinguished by a red cross on the doors of each. We shall begin with France, passing over with regret the exhibition of the Ministry of War, which was not examined by the jury, not having been completed at the time of their visits.

France.

According to the system usefully adopted by Dr. Gauvin, we shall divide this exhibition into four sections, as follow:—

1, Consisting of books, engravings, photographs, models, and plans; 2, alimentary products and medicinal preparations; 3, hospital furniture and ambulances; 4, instruments of medicine and surgery, and orthopædic apparatus.

In the first section we find a considerable number of works by Dr. Gaze, Dr. Chenu, M. Louis Cazenave, the Comte de Beaufort, M. Achard, M. Burin-Dubuisson, and others.

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRUMENTS, &c.
—
England.

In the English department, a work entitled, "America and her Army," by Robert Mackenzie, and various works on military hospitals in Italy, Switzerland, Baden, and Belgium; and a complete library of information on America, including the works of Belloc; the "History of the Sanitary Commission of the United States," by Dr. Thomas W. Evans; Dr. Hammond's "Military and Surgical Essays;" together with vast collections of photographic views of the localities which formed the theatre of war.

The second section is furnished almost exclusively by the United States of America, all the specimens having been supplied by Dr. Thomas W. Evans. Here we see extract of meat, preserves, spirits, preserved milk, oysters, lime juice, dried vegetables of all sorts, fish, fruit, syrups, tea, coffee, rice, &c. Several of these articles were tested by the jury, and found to be in a state of perfect preservation.

The third section is represented in France by M. Noeth, who exhibits a mechanical bed of ingenious contrivance; by the Comte de Bréda, who displays various articles furnished by M. Arrault, viz., medicine chests, surgical-instrument cases, articulated splints, havresacks, knapsacks, beds, brancards, lint,—in short, everything necessary for assistance to the wounded; by Dr. Dauvin, who exhibits a pack-saddle, saddle-bags, and a litter; by Captain Gogent, who shows complete horse trappings capable of being transformed into a bed, and containing apparatus for dressing 60 patients.

Messrs. Charrière and Mathieu, in Paris, have largely contributed to the ambulance department, in the way of litters, saddle-bags, and surgical instruments of every kind. M. Laforge, of Lyons, supplies dried and compressed vegetables. There are other objects too numerous to mention, but which the visitor will observe with interest.

In Italy the collection of Locati, of Turin, displaying ambulance carriages, cacolets, and litters; the Association Italienne de Secours aux Blessés, showing instruments by M. Barbieri (Milanese committee), and the exhibition of the same association, Florence committee, are worthy of remark.

We have also, in Italy, Messrs. Barbieri and Dalluciano, of Naples, and others, who exhibit litters more or less ingenious; and Oldenburgh, Mecklenburgh, Würtemberg,

SIR J. F.
OLLIFFE ON
MEDICAL
AND
SURGICAL
INSTRU-
MENTS, &C.
—
Prussia.

Switzerland, Spain, and Portugal have each contributed to the same department.

Prussia deserves special mention. Amongst the collections of this country is a large tent for 16 inmates. This tent is pitched in the park. In it are placed some smaller ones; and it contains, besides litters of various sorts, some of which are very ingenious, arm-chairs, brancards, and cheap bedsteads. In this tent is the King's ambulance carriage.

Prussia also shows operating tables, Langenberck's arm and leg baths and irrigators, and great varieties of lint, air-cushions, and bandages. There is also a curious invention of parchment-paper bags for cooling liquids by evaporation.

Baden.

In the grand duchy of Baden is the collection of Fischer, the justly eminent surgical-instrument maker of Heidelberg. He exhibits steam apparatus for hospitals, litters, and operation tables. Among his articles is the Garibaldi chair, very cleverly contrived, which, by an ingenious mechanism, may be transformed into a couch or bed, and admits of the patient taking various postures. It is handsomely covered, and the price seemed very reasonable. Fischer has already been mentioned as exhibiting surgical instruments of excellent quality.

Hesse.

In the grand duchy of Hesse the mechanical bed of Neuter attracted attention; Dick and Kirschter exhibit a spring carriage litter, cheap and solid.

United
States.

The collection made by the sanitary committee of the United States of America is by far the most complete and the most remarkable of the Exhibition. No detail, however trivial it may appear, has been omitted of a nature to succour the wounded and to alleviate their sufferings, and no expense spared to promote their comforts. At the same time the utmost attention has been, where it was possible, bestowed on economy, and some articles of wonderful cheapness are exhibited in this extraordinary collection.

The elementary products in the American department have already been alluded to. We must call attention to a plan, in relief, of the hospital at Philadelphia, consisting of several pavilions, each containing 60 beds. The jury were struck with admiration by the ingenuity displayed in the ventilating process, which has been applied all through the hospital, and in the construction of the water-closets. These latter are perfectly inodorous, and, strange to say, there is no water used. The air is continually renewed from without by means of a stove, which heats the internal air, thus forming a vacuum, into which the external air rushes with much force and dries the faecal matter, which is emptied every day.

In the centre of the American building is a complete and rich model of a steam ambulance carriage, containing 60 beds, and furnished with every requisite, such as surgical instruments, surgeon's room, operating tables, &c. There are also several ambulance waggons, litters, and cacolets, and some excellent elastic bedsteads, which are very solid and well-made, and cost only 7*l.* each. The surgical instruments are chiefly of Tieman's manufacture. We must also direct the visitor to inspect the army medicine-chests, soldiers' kits, stoves, coffee-making apparatus, portable kitchens, fracture-beds, bandages of all sorts, and ambulance carriages, of which there is a great variety. It would be unjust not to state that the greatest credit and praise are due to Dr. Thomas W. Evans for having brought together, at very considerable expense, this admirable collection, and thus made European surgeons acquainted with many details of which they had been previously ignorant. Dr. Evans has been most ably seconded in its formation by Dr. Crane, a distinguished and intelligent young army surgeon of the United States, who is generally to be found on the premises, and is at all times ready to afford information to inquiring visitors. The Americans also display a number of tents; among them is the umbrella tent, which can be folded up into an incredibly small space.

In the American department there is also an apparatus for the production of the nitrous oxide gas, which is now very generally adopted as an anæsthetic in the United States.

Messrs. Savory and Moore have remarkable specimens of ambulance panniers and medicine chests.

In England, Mr. Thomas Dixon exhibits an elegant and ingenious litter, called the "Nightingale Cradle," and Mr. Redford has, in the English War Department, a model of a stretcher.

The importance of the Exhibition of the Sanitary Commissions is such that it has attracted the peculiar attention, not only of the public, but also of the French, English, and other Governments, who have sent special commissions to examine and to report thereon.

A collective gold medal has been awarded to the International Exhibition by the jury of Class 11.

THE J. P. COTTE
ON MEDICAL AND
SURGICAL INSTRUMENTS
235

in the centre of the American building is a complete and rich model of a steam ambulance carriage, containing 150 beds, and furnished with every requisite such as surgical instruments, and apparatus, and every thing else. There are also several ambulance wagons, litter, and stretchers, and some excellent electric beds, which are very solid and well-made, and cost only \$1 each. The surgical instruments are chiefly of German manufacture. It is not only the visitor to inspect the many medical chests, medicine, and other things, but also the portable kitchen, and the baggage of all sorts, and ambulance carriages, in which there is a great variety. It would be unjust not to state that the greatest credit and praise are due to Dr. Thomas W. Evans for having brought together, at very considerable expense, this admirable collection, and thus made European weapons acquainted with many details of which they had been previously ignorant. Dr. Evans has been most ably assisted in the formation of Dr. Evans, a distinguished and talented young surgeon of the United States, who is generally to be found on the premises, and is at all times ready to afford information to inquiring visitors. The Americans also display a number of tents; among them is the mosquito tent, which can be folded up into an incredibly small space.

In the American department there is also an apparatus for the production of the nitrous oxide gas, which is now very largely adopted as an anesthetic in the United States. Messrs. Savory and Moore have remarkably ingenious and valuable machines and medicines.

In England, Mr. Thomas Evans exhibits an elegant and ingenious apparatus, called the "Nightingale Candle," and Mr. Stoddard has in the English War Department, a model of a hospital, and a model of a hospital.

The importance of the Exhibition of the Sanitary Commission is such that it has attracted the particular attention not only of the public, but also of the French, English, and other Governments, who have sent special commissions to examine and to report thereon. The gold medal has been awarded to the jury of Class 11.

REPORT on PHILOSOPHICAL INSTRUMENTS and APPARATUS for TEACHING SCIENCE.—(Class 12.)—By C. R. WELD, Esq.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

Although not calculated to arrest the attention of the majority of visitors to the Paris Exhibition, the philosophical instruments and apparatus for teaching science take high rank among the vast variety of objects amassed in the Champ de Mars. For it is by means of instruments like these that nature has revealed many of her most important secrets to man. Viewed in this light, an examination of the philosophical instruments in this remarkable Exhibition cannot fail to be deeply interesting and at the same time instructive.

Without the means of instituting experiments, often necessarily of an extremely delicate nature, theories cannot be made to rest on the broad and substantial basis of facts, and no surer means can be taken to accomplish this than to bring before the philosopher a collection of instruments emanating from scientific workshops in various countries, thus enabling him to draw valuable information from the physical labour of others, which will, when applied to arts and manufactures, contribute to the advantage of mankind generally. As the successful scientific speculations of the last three centuries have been the natural sequel to the art-energies of the preceding ages, so must the newest scientific speculations of our contemporaries and their successors, in order to be successful, be the result and consequence of powers as yet often appearing in the undeveloped form of art alone which exist among us at the present day. Thus a great exhibition of the works of material art should carry with it its scientific moral, and the opportunities of surveying a vast practical art-world, and of appreciating the probable results of its sway, may well be deemed too valuable to be allowed to be let slip for the purposes of that scientific study and speculation which naturally arise from such opportunities.

Value of
philosophi-
cal instru-
ments.

Philosophical instruments, processes depending on their use, models, &c. are represented in the Paris International Exhibition by 490 exhibitors. The countries of these exhibitors testify how philosophical science is extending over our globe. The following table will enable a comparison to be instituted between the exhibitors of philosophical instru-

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

Number of
exhibitors of
philosophi-
cal instru-
ments in
1862 and
1867.

ments at the last London International Exhibition and those exhibiting in the Paris Exhibition of this year:—

	1862.	1867.		1862.	1867.
Algeria - -	—	3	Norway - -	3	7
Austria - -	21	20	Papal States - -	1	6
Baden - -	1	4	Portugal - -	1	3
Bavaria - -	3	17	Prussia - -	20	24
Belgium - -	8	7	Russia - -	5	18
Brazil - -	2	3	Siam - -	—	1
Canada - -	—	5	Spain - -	—	5
Denmark - -	4	1	Sweden - -	12	13
Egypt - -	—	10	Switzerland - -	9	14
France - -	62	112	Tunis - -	—	1
Hanover - -	2	—	Turkey - -	—	60
Hesse - -	2	3	United Kingdom - -	162	29
Holland - -	10	9	United States - -	1	15
Italy - -	19	91	Uruguay - -	—	1
Liou-Kiou - -	—	1	Wirtemberg - -	3	4
Natal - -	—	2			
Nova Scotia - -	—	1		351	490

It appears by the foregoing table that the total number of exhibitors in the department of philosophical instruments at the Paris Exhibition of 1867 exceeds those who exhibited in the London International Exhibition of 1862 by 139. We also find exhibitors in this class from Siam, Tunis, Liou-Kiou, Brazil; not, it is true, placing before us any very remarkable instruments or scientific models or drawings, but, still, objects which testify that the torch of science has been lighted in far distant countries, and a spirit of philosophical investigation awakened.

It will be also seen by the foregoing table that the great increase in the aggregate number of exhibitors in the present Exhibition is sustained in the class of philosophical instruments; and the fact is the more remarkable when it is considered that the United Kingdom is represented by only 29 exhibitors, whereas it sent 162 to our International Exhibition of 1862.

The space at our disposal will only enable us to note the most important objects exhibited.

ASTRONOMICAL INSTRUMENTS.

Astronomi-
cal instru-
ments.

The transcendent achievements of astronomical science are due in a great measure to the excellence and precision of astronomical instruments. For although the observation of the heavenly bodies has always been a favourite pursuit

of philosophers, it was not until the close of the seventeenth century that great exactitude was attained in the principle and practice of observation. At that period telescopes of far higher power than had hitherto been used were brought to bear on the heavens; and they were provided with delicate micrometers, for making micrometric measurements. But, remarkable as were these instruments, compared with those used by preceding astronomers, they appear insignificant by the side of those constructed during late years for national observatories.

The great risk, however, attending the carriage of philosophical instruments, and especially large equatorials, will always cause countries to be inefficiently represented in this department at international exhibitions. Thus, the Paris Exhibition, like its London predecessor of 1862, fails to illustrate the high perfection to which the great makers of astronomical instruments have attained. Many of the most eminent makers, and especially the English, do not exhibit; and there is only one reflecting telescope in the Exhibition. This is the more to be regretted as great attention has lately been paid in the United Kingdom by eminent men of science to the improvement of the latter instrument, particularly with reference to the construction of a powerful reflector which it is proposed to set up at Melbourne for the purpose of observing the astronomical phenomena of that hemisphere.

The Royal Observatory at Greenwich and those of Oxford, Cambridge, Edinburgh, the Cape of Good Hope, Berlin, and Paris, have been largely supplied with important, and in many cases novel, instruments of great power; while the munificence and enterprise of private individuals—such as Lord Rosse, Mr. Nasmyth, and Mr. De la Rue—are continually evoking new efforts of mechanical skill, to the great advantage of astronomical science. It would, however, be unreasonable to expect to find many large astronomical instruments at an exhibition. They are always made to order, and, when finished, are forwarded to the observatories or other establishments for which they are required. An exception might have been made with respect to the astronomical and geodesical instruments of the highest excellence, constructed under the direction of Colonel Strange, by Troughton and Simms and T. Cooke and Sons, for the use of the great trigonometrical survey of India for the determination respectively of longitude and latitude. These instruments, consisting of a great theodolite, zenith sectors, 5-ft. transit instruments, vertical circles, galvanic chronographs, and astronomical clocks, are not only remark-

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

able for their great mechanical excellence, but also for various ingenious mechanical modifications and arrangements designed by Colonel Strange. The 5-ft. transit instrument has a very powerful telescope of 5 in. clear aperture (a very large diameter in proportion to its focal length). The axis is of aluminium bronze, cast in one piece, hollow, and turned both inside and out. All the instruments combine in a very remarkable manner maximum power with minimum weight—always highly desirable; and are, in all respects, by far the best of their kind that have been made. Under these circumstances, it is to be lamented that an application to the Secretary of State for India for permission to exhibit them in the Paris Exhibition was unsuccessful. They would have excited great admiration and reflected high credit on Colonel Strange and their makers.

One of the principal features in connection with astronomical instruments is the change that has taken place during recent years in their construction. Formerly, and the remark applies to philosophical instruments generally, there was a tendency to make them extremely heavy. The result was, undoubtedly, solidity, but this was attained at the expense of great unwieldiness. There is a very old microscope exhibited among archæological objects in the French department of the Exhibition which aptly illustrates the case in point. It is very large, very heavy and cumbersome, and yet of such low power that a modern microscope of less than one quarter its weight is far more easy of adjustment, besides being at the same time much more powerful. Mechanical skill has effected a great revolution in the metal work of instruments. All superfluous adjustments are rejected, and the greatest possible solidity is given to those retained. Lightness with great strength is attained by the use of aluminium bronze, which is now used in the construction of astronomical instruments, and would be more extensively employed if a method of obtaining sound castings with certainty could be discovered. It is but little affected by ordinary chemical agents, and possesses a strength, both tensile and transverse, exceeding that of wrought iron.

The largest equatorial exhibited is that constructed by Brunner Brothers, of Paris (89). The object-glass of this fine instrument is 8·4 in. in diameter, and it is provided with a very accurate clock movement, constructed on principles calculated to afford perfect regularity of motion without tremor. The general appearance of this instrument is elegant, while the workmanship throughout is of the highest excellence. It has been constructed, by order of the Viceroy of Egypt, for the observatory of Boulik, near Cairo.

P.G. Bardou exhibits, in the French department, a large telescope (49), with altazimuth mounting and a 9.2 in. object glass; but the general construction of this instrument is by no means of a first-rate description.

Mr. Dallmeyer, United Kingdom (9), exhibits a 6-ft. equatorial, with 5-in. object-glass, embracing all the most recent improvements. The principal feature in this admirably constructed instrument is that the same clock motion moves two circles, one of which shows sidereal time, while the other moves the telescope. The form of pedestal and position of the clock are such that the clock weight descends in the centre of gravity of the instrument, thus increasing the steadiness of the telescope.

M. Evrard, France (92), exhibits a large astronomical telescope, with a 9.2 in. object-glass and a horizontal and vertical motion; but, apart from the size of the object-glass, there is nothing remarkable in this instrument.

Secretan, France (90), exhibits a small reflecting telescope, equatorially mounted, carrying a Foucault's silvered glass speculum of 9.4 in. diameter. The construction of this instrument is admirable, and well deserves the closest examination. Although the mirror, compared to the large 6 ft. and 4 ft. speculas of Lord Rosse is very small, the brilliancy and perfection of its surface gives this telescope very high power. The speculum consists of a polished surface of glass, on which a very thin coating of silver is deposited, by the process of decomposing the ammonia-nitrate solution of silver by dilute tartaric acid. This mirror has been found, by various trials, to possess considerable advantages over those made with speculum metal, which are very liable to injurious flexion by their own weight. It also reflects a greater amount of light than mirrors made of speculum metal, in the proportion of 92 to 65. The great brilliancy and perfection of M. Foucault's mirrors will be best appreciated by examining those exhibited near Secretan's telescope.

Reflecting
telescope.

silvered glass
speculum

It is satisfactory to be able to record that the result of a trial by the jurors of the refracting astronomical telescopes is to place Mr. Dallmeyer at the head of the list. The performance, power, and definition of his equatorial surpasses that of the other astronomical telescopes. Secretan's reflector was found to be equal in power to Mr. Dallmeyer's refractor. The next in order were Brunner Brothers, Evrard, and Bardou. The glass of which Mr. Dallmeyer's object-glass is constructed was made by Messrs. Chance, of Birmingham; the glass of the object-glasses of the Paris instruments by Mr. C. Feil, of that city, who exhibits (76) several extremely fine specimens of optical glass. There

Optical
glass.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

are some good altazimuth and transit instruments exhibited in the French department. Those shown by M. Balbreck and Brunner Brothers (85 and 89) are particularly worthy of notice. The altazimuth instruments exhibited by the latter are applicable either to astronomical or geodesical purposes, both circles being read off by means of micrometer microscopes. The workmanship of these instruments is admirable, the conditions of rigidity with lightness having been attained in the most successful manner. F. A. Rigaud, France (94), exhibits a portable transit circle for determining both latitude and longitude. It is provided with a compensating micrometer, and is in all respects an admirably-constructed instrument. A duplicate of this fine transit circle is exhibited by Secretan (90), both instruments having been made under the superintendence of M. Villarceau, of the Paris Observatory. T. Ertel and Son, Bavaria (7), also exhibit a good meridian circle.

TELESCOPES.

Hand tele-
scopes.

The display of mounted and hand telescopes for amateur astronomers and for military, naval, and travelling purposes is very large. T. Ross, United Kingdom (22) exhibits several telescopes of excellent definition—one for astronomical purposes, is mounted on a stand of very ingenious construction, with extremely convenient horizontal and vertical motion. T. Ross and J. H. Dallmeyer, United Kingdom (22, 9), have been very successful in producing hand telescopes of a superior description. They exhibit instruments the focal lengths of which are only from nine to ten times the diameter of their clear aperture. The performance of these instruments is most excellent. R. and J. Beck, United Kingdom (3), exhibit a new binocular telescope, with which some very interesting features connected with binocular vision can be observed. Bardou, France (49), exhibits a great variety of telescopes and binocular opera glasses, some of which are mounted in aluminium. M. Bardou possesses the means of soldering this metal, which enables him to use it extensively for large hand telescopes. The low price of Mr. Bardou's small telescopes and opera glasses, of which he supplies great quantities to England, is very remarkable when considered in connexion with their excellent workmanship and good definition. A. Paillard, France (74), exhibits various opera glasses which, by an ingenious contrivance, can be changed for use in the country, marine purposes, or for the theatre. F. V. Teigne, France (18); Rieder, France (60); Lebrun, France (77); Steinhil, and Merz, Bavaria (5 and 6), also exhibit good telescopes, with

Opera
glasses.

in some instances, new contrivances for mounting. The opera glasses and lenses for telescopes and photographic cameras exhibited by Voigtlander and Son, Austria (18), are excellent, and fully sustain the well-known reputation of this highly eminent firm.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

In connexion with astronomical telescopes, an observing chair, exhibited by Mr. E. Tyer, United Kingdom (28), may be noticed for its ingenious and, at the same time, simple construction.

SURVEYING INSTRUMENTS.

The show of these important instruments in the Paris Exhibition is greatly superior to that in the International Exhibition of 1862; for, though not presenting any great novelty of construction, their workmanship is better, and, with few exceptions, they display greater perfection and a much higher finish. This is especially remarkable with respect to a theodolite, constructed by J. Brauer, Russia (16), under the direction of Professor Jacobi, of St. Petersburg. This instrument, which was tested by the jurors, was found to be wonderfully accurate, and to answer all its requirements admirably. F. Drier and Co., France (25), exhibit several beautiful surveying instruments, many of which were used in the survey of Paris. They highly merit the closest examination. The levelling instruments shown by Gravet-Tavernier, and Rigaud, France (23 and 94), are excellent. The latter exhibits a theodolite made of platinum. The instruments of this description exhibited by J. Kern, Switzerland (10), have long enjoyed high reputation. Several will be found in the Paris Exhibition remarkable for their precision and very moderate price. The principal novelty they display is in their mechanical arrangements, though in the opinion of some of the jurors rigidity has been somewhat sacrificed in the endeavour to obtain lightness. The establishment of M. Kern at Aarau, employs 120 workmen in the manufacture of surveying and mathematical instruments, large quantities of which are exported to England. The theodolites exhibited by Pistor and Martins, of Berlin, Prussia (6), are of the highest order of excellence, and are remarkable for a very ingenious apparatus for reversing the telescope in its bearings. The Société pour la Construction d'Instruments de Physique de Genève, Switzerland (12), also exhibit good surveying instruments, very remarkable for their moderate price. The Industrial Institution of Lisbon, Portugal (2), exhibits well-constructed theodolites, showing a great advance in excellence of workmanship over those exhibited by the same institution in 1862. Cavaliere

Surveying
instru-
ments.

Theodolites.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

Rossi, of Rome, well known for his admirable survey of the Catacombs under that city, exhibits a stenographic and orthographic machine, which has been used with great success in this subterranean survey. "The machine is carried in the hand. A long micrometer screw has a pulley at one end; over this pulley is wound an endless cord of definite length, as, say, one yard. The operator, placing himself close to the wall to be surveyed, measures off yard by yard with his cord. The act of doing so turns the screw at each yard, a definite quantity, of which the proportion to the yard is known. The screw moves a tracer over a piece of paper fixed horizontally on the machine. The tracer has two points, which can be separated by a quantity representing the width of the path or gallery being surveyed. The vertical section is obtained by analogous means, a light being carried in advance of the observer, on which to direct a pair of sights, the inclination of which determines the position of another tracer on a second piece of paper attached to the machine." Such an instrument cannot, of course, give very accurate results; but with it Cavaliere Rossi has made a very interesting survey of the Catacombs.

H. Schaeffer, Grand Duchy of Hesse (2), exhibits several good theodolites and levels. The workmanship of these instruments is of a superior order, and reflects great credit on the establishment from which it emanates. Becker and Buddingh, Holland (7), also exhibit some well-constructed levels of good quality.

Planime-
ters.

Under the head of surveying instruments may be included planimeters and telemeters, several varieties of which will be found in the French department of philosophical instruments. Planimeters, which, it may be remarked, are more used on the Continent than in our country, are constructed for ascertaining, without entering into trigonometrical calculations, the area embraced within any given outline traced on a plane surface. "The instrument acts on the principle of mechanical integration—that is, the summing up the small areas into which any given figure may be supposed to be divided by an indefinite number of equidistant lines, either parallel to each other or on passing through the same point, the former indicating in geometrical language rectangular and the latter polar co-ordinates. It will be easily understood that, if motion can be communicated to a rotating wheel which is jointly proportional to the number of successive lengths of the elementary portions into which the surface is supposed to be divided, the aggregate motion of the wheel multiplied by some known constant will represent the superficial area to be determined."

Telemeters, or, as the name implies, distance measurers, consist of two telescopes placed at the ends of a short base, composed of two concentric tubes containing reflecting prisms, by which the object is bisected horizontally and the images of the upper and lower halves brought before the eyes of the observer. A coincidence can be obtained by moving one of the prisms attached to a long graduated arm, the reading of which gives, by reference to a table, the required distance of the object. Specimens of both these instruments are exhibited by Gravet-Tavernier and I. Lefebvre, France (23 and 42).

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.
—
Telemeters.

SEXTANTS.

A very fine display is made of these instruments, particularly by Paris makers. Several exhibit important modifications of the original sextant, especially in the introduction of artificial horizons for use on shore, or at sea when the sea-line is hazy. It is to be regretted that the eminent English makers of these instruments have not exhibited, for at the Exhibition of 1862 their sextants and quadrants were remarkable for excellence of construction and moderate price.

Sextants.

A sextant, with attached spirit-level horizon, exhibited by G. Davidson, United States (8), is worthy of examination.

The difficulty of procuring good plane and parallel glasses at a moderate price for sextants has hitherto been very great, and there exist but few artists capable of supplying with certainty and in perfection these important objects. The glass made by C. Feil, France (76), for sextants is by far the best in the Exhibition. Mr. Butters, of London, has devoted himself for many years to the manufacture of glasses for sextants, which are of the highest quality; but he, unfortunately, does not exhibit on the present occasion.

INSTRUMENTS
EXHIBITED

MATHEMATICAL DRAWING INSTRUMENTS.

Mathematical
drawing
instru-
ments.

The show of mathematical instruments in the Paris Exhibition leaves scarcely anything to be desired. They combine, in a very remarkable manner, great accuracy and high finish, with, in many instances, economical manufacture.

Mathematical
drawing
instru-
ments.

Elliott, Brothers, United Kingdom (13), who have long been celebrated for their mathematical instruments, exhibit an extensive and most beautiful collection. Their construction and high finish cannot be surpassed. Gravet-Tavernier, France (23), and J. Kern, Switzerland (10), also exhibit

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &C.
—

excellent instruments of this description. The latter are remarkable for their very moderate price.

Darling, Brown, and Sharpe, United States (11), show an admirable series of steel measures of length, steel caliper-tubes, Vernier calipers, universal squares, centre gauges, bevel protractors, and specimens of the American wire gauge. The accuracy of their steel straight edges is very great, and the general construction of their instruments is excellent. The divisions on the scales are effected by machines and are extremely clear and accurate. These articles are manufactured on a large scale for the engineering establishments in the United States, and also for the English market.

The mathematical instruments exhibited by J. Royer, France (69), are extremely good; one for drawing parallel lines by the action of a spring is very ingenious. Haff Brothers, Bavaria (9), exhibit a very complete collection of mathematical instruments, displaying excellent workmanship. Their cost is extremely moderate, considering their very superior quality. A magazine case containing a beam compass, a proportional compass, six pairs of compasses of various kinds, several excellent drawing-pens, graduated rulers, sectors, and protractors, all in electrum metal, is priced 3*l.* 18*s.*

C. Riefler, Bavaria (10), also exhibits good and moderate-priced instruments.

DIVIDING ENGINES.

Dividing
engines.

Several of these instruments may be seen in the present Exhibition. Among the best are those of L. Perreaux, France (31), who exhibits circular and straight line dividing-engines of various sizes, and, as far as they could be tested, of very great accuracy. C. A. Guillemot, France (40), also shows a dividing-engine of a novel construction, provided with an arrangement by means of which a curve exhibiting its own error can be described. The above makers also display some very delicate cathetometers, by which the distance between two points in a vertical line can be determined to 1-2000th of a millimètre (00002 English inch). Two cathetometers, exhibited by G. Brauer, Russia (16), made under the direction of Professor Jacobi, also merit examination. The smaller one is exquisitely finished, and is capable of measuring distances between two points with very great precision.

Catheto-
meters.

It is absolutely essential in the construction of these delicate instruments that the working parts should be free from tremor. This condition has been attained in the above instruments, which are decidedly the best cathetometers that have ever been exhibited.

PANTOGRAPHS.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

Several pantographs, embracing in some instances new constructions, are exhibited; but the only instrument of this kind which merits special notice is that exhibited by A. Gavard, France (33). This instrument, consisting of a series of brass rods jointed together in the form of a parallelogram, so as to have perfectly free motion in a horizontal plane, is made by very ingenious and novel contrivances to produce duplicate reductions of figures, &c., not only on plain surfaces but on cylinders. By its means patterns may be drawn and engraved on copper rollers with the greatest precision, and impressions taken from them. The invention, which is highly creditable to M. Gavard, is likely to be of great benefit to the calico-printing trade.*

Panto-
graphs.

Under the head of pantographs may be included a microscopic writing machine, exhibited by E. Hardy, France (91), but which in its performance falls far short of Mr. Peter's celebrated machine exhibited in 1862, with which the entire Bible may be written three times in the space of a square inch.

Microscopic
writing
machine.

BALANCES.

The present Exhibition presents a large and highly-credit-able display of balances of precision, principally, however, of Continental manufacture. No very notable improvement in the construction of these important instruments appears to have been introduced within the last few years; but it is observable that foreign governments are extremely anxious to procure as standards the best possible balances from the most celebrated makers. Thus, several balances are exhibited constructed by order of governments for cities and towns. Those exhibited by I. C. Besson and E. E. Bailly, France (4 and 86); E. Sacre, Belgium (7); and L. Reimann, G. Horn, and F. Hegershorff, Prussia (4, 8, and 12), are remarkable for their high finish and great precision. The material of the beams, except in those of very large size, is generally brass; but many of the smaller balances for laboratory purposes are made of aluminium bronze, which, on account of its great rigidity, is a material peculiarly suitable for balance beams.

MICROSCOPES.

The collection of microscopes, including binocular instruments, is remarkably fine. Certainly, within the last few

Micro-
scopes.

* It is to be regretted that a very elaborate pantograph, contrived by M. Wagner, of Berlin, was not included in Class 12. It is placed in Class 58.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

years the improvements that have been made in the mechanical arrangements of microscopes have been very great, and especially by English makers. The introduction of the binocular arrangement of Mr. Wenham and that of M. Nachet, of Paris, have created a new era in the history of the microscope. Mr. Wenham's contrivance, now generally adopted, consists in intercepting one half of the pencil emerging from the object-glass by a prism placed immediately above it, the transverse section of which is a trapezium of such figure that the transmitted half-pencil is made to form the usual visual angle with the undisturbed half; the surfaces of incidence and emergence being both perpendicular to the respective directions of the rays which suffer two internal reflections in passing through the prism. The object is therefore seen stereoscopically, though in somewhat exaggerated relief. Several new and important modifications of illuminating apparatus have also been recently introduced.

The microscopes exhibited by R. and J. Beck, J. H. Dallmeyer, and T. Ross, United Kingdom (3, 9, and 22), in their mechanical arrangements, means of illumination, and powerful and clear definition, leave scarcely anything to be desired. Among other novelties introduced by Messrs. Beck is that of a binocular $\frac{1}{8}$, in which the prism is fitted immediately behind the back lens of the object-glass, and which, by means of a small screw, can be adjusted so as to divert any number of rays into the second tube; by this contrivance the full field of the object-glass is obtained, and the effect of monocular and binocular visions on the same object can be readily compared. Messrs. Beck also exhibit a 1-20th object-glass, and, under the head of Apparatus for the Microscope, other important novelties. But, although the English microscopes are the best in the present Exhibition, having come out victoriously in the trial of microscopes by the jurors, the microscopes exhibited by Continental makers may be profitably studied. The greater proportion show a marked improvement over those exhibited in 1862, especially with regard to their mechanical arrangements. The microscopes exhibited by E. F. Hartnack, France (51), should be examined carefully. Their peculiarity consists in the employment of two sets of high powers, one of which is used by immersion in water, which prevents a considerable amount of colour resulting from refraction being apparent, and causes, under some circumstances, a greater amount of light to be transmitted; but Mr. Hartnack's object-glasses do not approach the English glasses in angular aperture. This principle of construction has not been carried out by English microscope-makers, all their objectives being corrected for the reception of rays from air.

The microscopes exhibited by Mirand et Fils, France (52), combine a polariscope, and possess many ingenious mechanical arrangements. E. Gundlach, Prussia (13), S. Merz, Bavaria (6), and La Société pour la Construction d'Instruments de Physique de Genève, Switzerland (12), also show microscopes which should be examined for various novel mechanical arrangements.

F. A. Nobert, Prussia (14), exhibits a complete series of his celebrated test-lines, for which he received a medal in the Exhibition of 1851; and Messrs. Beck show a very comprehensive and interesting set of microscopic objects.

Test-lines.

SPECTACLES.

The exhibition of spectacles in the French department is by far the best in the Exhibition. Those exhibited by Delabre and Co., the Société des Lunétiers, and Morey Baillet, France (34, 80), are very remarkable for their excellence and moderate price. The latter exhibits well-made spectacles, in steel frames, which are sold at 3*f.* the dozen. The eminent British makers of these articles who exhibited largely in 1862 are absent on the present occasion, and thus no comparison can be instituted between them and the foreign spectacle-makers. It is satisfactory to find that in the case of nearly all the best descriptions of spectacles exhibited provision has been made to enable the axis of each eye to coincide with the central spot of the lens; without this arrangement spectacles must be always more or less defective.

Spectacles.

SPECTROSCOPES.

Since Fraunhofer's discovery that the solar spectrum is not continuous, but consists of luminous spaces separated from each other by numerous dark bands, researches in the spectra of various kinds of lights have been pursued with great diligence by many eminent philosophers. It has been ascertained that all simple bodies, especially those of a metallic nature, when raised to the state of incandescent vapour emit light, which, when submitted to prismatic decomposition, does not present a continuous spectrum, but isolated bands of different colours and of different but definite degrees of refrangibility. The colours of these bright lines and their position in the spectrum are found to depend on the chemical nature of the body which emits the rays, and to be invariable for the same substance. To this method of investigation we owe the discovery of several new metals, and it has been ascertained that luminous vapours of iron, nickel, chromium, calcium, magnesium, potassium, and sodium, with some others,

Spectro-
scopes.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

exist in the vicinity of the sun. In order to pursue this extremely interesting branch of physical science, which, it is confidently expected, will give us a great insight into the physical constitution of the stellar as well as of the solar photospheres, great attention has been recently paid to the construction and improvement of spectrosopes. Some remarkably fine instruments of this kind are exhibited in the present Exhibition. By far the most noteworthy is that shown by L. J. Duboscq, France (88), constructed after Steinheil's model. The beam is successively transmitted through six prisms of 60 deg., by which means the separation of the bands of the spectrum is greatly increased. By an ingenious contrivance these prisms can be easily moved in combination. It is to be regretted that a magnificent spectroscope, with nine prisms, constructed by Messrs. Spencer, Browning, and Co., of London, has not been exhibited.

DIFFRACTION AND POLARISING APPARATUS.

Polarising
apparatus.

The beautiful and highly-interesting phenomena of diffraction and polarisation have lately engaged considerable attention, and for their observation very ingenious and delicate apparatus has been constructed by English and Continental philosophical instrument makers. The ordinary chromatic phenomena of diffraction are most easily and conveniently observed by transmitting a pencil of light through a fine wire grating, or reflecting it from a polished surface on which exceedingly fine parallel and equidistant lines are ruled. They are produced by the interference of certain rays deflected from their original path by the contiguous lines. The theory of the reflection of polarised light is one of the most interesting problems in physical mathematics. Briefly, polarised light may be described as the result of the motions or rapid vibrations of a beam of ordinary light revolved in two planes at right angles to each other, which is effected by transmission through or reflection from the surfaces of various substances. When the light is thus affected it exhibits an extremely beautiful class of phenomena, known under the name of polarisation.

At the Exhibition of 1862 many ingenious contrivances for polarising light were exhibited by English makers, who do not, however, come forth in any strength in this department on the present occasion. The most complete and interesting polarising apparatus is that exhibited by L. Duboscq and Bertaud, France (88 and 58). The object of one of the instruments shown by the latter is to measure the axes of polarisation. M. Bertaud also shows hollow

prisms for liquid refraction, combining a goniometer and polariscope. Several extremely ingenious ophthalmoscopes are exhibited by this maker. One has been used with great success for examining the interior of the larynx, uterus, and viscera.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.
Goniometer.

H. J. Soleil, France (53), contributes a variety of polarising apparatus of very ingenious construction, and also Fizeau's apparatus for exhibiting the dilatation of crystals.

C. H. Seguy and Alvergnyat Brothers, France (35 and 36), also exhibit elaborate apparatus for showing the fluorescence of crystals.

HELIOSTATS.

These instruments, the principal object of which is to maintain a solar beam continuously directed to one point, may be seen to great perfection in the French department. The heliostats of Silbermann and Foucault, executed and exhibited by Duboscq, are highly remarkable for their beautiful mechanical arrangements and regularity of motion. The heliostat of M. Foucault has lately undergone considerable improvements, and is a very perfect instrument.

Heliostats.

ACOUSTIC INSTRUMENTS.

Various ingenious contrivances have been devised for the automatic delineation of sonorous vibration. The best apparatus for this object—and, indeed, the only apparatus of a truly philosophical nature—is that exhibited by R. Kœnig, France (87). M. Kœnig has been engaged for many years in investigating the laws of sound, and has contrived a great variety of instruments for their illustration by remarkable and striking experiments. His exhibition is certainly one of the most interesting features in the philosophical department. Besides his own apparatus, M. Kœnig exhibits that of M. Lissajous and Desains, which comprises several novelties.

Acoustic
instru-
ments.

L. Magrini, Italy (36), exhibits electrical apparatus for illustrating various principles of acoustics, constructed for the Royal Museum at Florence, with which he has illustrated interesting lectures in that city.

METEOROLOGICAL INSTRUMENTS.

The great attention devoted during recent years to the investigation of the laws of meteorology has naturally led to a considerable improvement of meteorological instruments. It is worthy of remark, as illustrating the deve-

Meteorolo-
gical instru-
ments.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

lopment of meteorology, that at the Exhibition of 1851 the meteorological instruments were not only extremely limited in number but, with very few exceptions, totally unfitted for trustworthy meteorological observations. The result of this shortcoming was to create a new and better class of instruments; and at the Exhibition of 1862 a great number of admirable meteorological instruments were exhibited, especially by English makers. The absence of the majority of eminent London philosophical instrument makers from the present Exhibition prevents a correct estimate being formed of the improvements effected in meteorological instruments. Those exhibited, however, are amply sufficient to show the desire that exists to improve and perfect these important instruments.

By far the most remarkable meteorological apparatus is that exhibited by Padre Secchi, Papal States (1). Padre Secchi has long been known in the scientific world for his astronomical and meteorological researches. He is director of the observatory attached to the Collegio Romano, and has been engaged for many years in cultivating and teaching the physical sciences. With great labour, and deriving but little assistance from his Government, he has succeeded in constructing the best self-registering meteorological apparatus that exists. The temperature, pressure of the atmosphere, direction and force of the wind, amount of rain and humidity, are accurately recorded by means of curves traced on paper by the apparatus, which is acted upon by clock-work and voltaic currents. The apparatus has been removed from Rome, where the writer has seen it working with great regularity.

R. and J. Beck, United Kingdom (3), exhibit a new mercurial mountain barometer, of a very sensitive character and extremely portable. It has been tested at a height of 14,000 ft., and found to be very accurate.

E. R. Hammatt, United States (3), as president of the American Aëloscope Company, exhibits, on the part of the company, a new "aëloscope" barometer invented by Mr. H. A. Clum. The feature of this instrument is, as its name implies,* to show the powerful atmospheric vibrations which precede storms. According to the statements of the inventor it is extremely sensitive, and requires no correction of any kind whatever. The point indicated on the dial is correct, the instrument being compensatory in every particular. The principle consists in the combination of air-gas chambers with a float connected with a mercurial column in

New mountain
barometer.

* From *ἄελλα*, storm; and *σκοπή*, view.

such a manner that the chambers are acted on by the atmosphere surrounding them. But the instrument is so large and costly, varying in price from 1,000 dols. to 10,000 dols., that it is not likely to come into general use or to supersede ordinary mercurial barometers.

A. G. Theorell, Sweden (9), exhibits a self-registering barometrical and thermometrical apparatus of apparently ingenious construction; but, as the apparatus is not completed, and the inventor was not present to explain its action, the writer is unable to give any detailed report upon it.

Naudet and Co., France (11), exhibit a very extensive collection of aneroid barometers, of which they are the principal manufacturers in Paris. They are of various sizes, from those intended for public buildings to delicate and minute pocket instruments. Improvements have been introduced by Messrs. Naudet, which, while increasing the sensitiveness of aneroids, render them less liable to be deranged by concussion. Few philosophical instruments afford greater proof of the perfection to which workmanship has arrived than the aneroid barometer. It was first invented by Conté, better known for the drawing-chalks which bear his name, when he was appointed director of the aerostatic establishment at Meudon, founded by the first Napoleon. He was desirous to make a barometer without mercury, to be used in connexion with balloons, and contrived an instrument on the principle of the present aneroid barometer, which he, however, discarded, being unable to make it sufficiently sensitive. In the hands of Vidi and others the aneroid barometer has become a most reliable instrument.

Aneroid
barometers.

F. Richard, France (14), exhibits several barometers on the aneroid principle, but differing from Conté and Vidi's instruments in their construction. They were invented by M. Bourdon, and are based on the tendency possessed by a coiled and exhausted tube of thin metal to contract or elongate when subjected to variations of pressure. The form of tube is not circular, but a little flattened and curved inwards. The tube is exhausted of air and hermetically sealed at both ends. As the atmospheric pressure from without increases on the tube, the variations of curvature gradually change. M. Richard states that his barometers constructed on this principle are compensated, and require no correction.

A great variety of excellent thermometers are exhibited. Those made by J. L. Révérend, France (39), are particularly deserving of notice for their clear and well cut graduations. R. and J. Beck's exhibition of thermometers, including

Thermo-
meters.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

maximum and minimum, is highly to be commended. A. D. Bache, United States (1), shows a deep-sea thermometer, of novel construction, for registering the temperature by the action of metallic bars. The instrument is used by the United States Government Coast Survey.

Anemome-
ters.

Several good anemometers are displayed. They are constructed for the most part on Dr. Robinson's principle, in which four hemispherical cups revolve with the pressure of the wind and give action to most of the other parts of the apparatus. The cups are found to revolve with one third the velocity of the wind. R. and J. Beck exhibit an excellent anemometer, and those shown by G. W. Lyth, Sweden (2), and J. B. Hennault and Son, Belgium (4), are to be commended for their mechanical arrangements.

Hydrome-
ters.

Hydrometers, which form the basis of many important mercantile transactions, are abundant in the present Exhibition. Almost all countries exhibiting philosophical instruments show one or more hydrometers—the names of saccharometer, salinometer, lactometer, serinometer being applied to the purpose for which the instrument is constructed. It will be noticed that almost all the hydrometers exhibited are made of glass. They are, of course, more liable to destruction by accident, but they possess the important advantage that their indications cannot be vitiated by accident, while metallic instruments being necessarily very thin, are liable to be indented and bruised.

CALCULATING MACHINES.

Calculating
machines.

Under this head the present Exhibition shows no advance over that of 1862, the few calculating machines exhibited being of a very elementary nature. These instruments are essentially of two kinds. In the simpler form the operation of addition is effected by causing a figured wheel to advance a given number of unit spaces, by moving through the same number of spaces a wheel with which it is in gear. The process of multiplication is merely that of successive additions; and subtraction and division are the inverse processes of the former. The celebrated Pascal constructed a machine for executing the ordinary operations of arithmetic; and Leibnitz invented another by which arithmetical computations might be made. The only calculating machines in the Paris Exhibition worthy of notice are those exhibited by R. Dunlop, United Kingdom (12), and C. X. Thomas, France (29). Mr. Dunlop's machines multiply and divide money by numbers from $\frac{1}{32}$ nd of an unit to 100,000 and upwards; multiply and divide money by weight, tons, cwt.,

qrs., lbs., and compute series of calculations decimally (such as costs of manufacture, &c.), having a common multiplier or divisor. Mr. Thomas's instrument multiplies eight figures by eight in eighteen seconds; divides sixteen figures by eight in twenty-four seconds; and extracts the square root of sixteen figures in ninety seconds. The price of the instrument is 20*l*. It is to be regretted that a specimen of one of the extremely ingenious and beautiful calculating machines of Messrs. Scheutz, of Stockholm, is not in the Paris Exhibition. One of these machines is in the office of the Registrar-General in London, where it is performing very useful work. It not only calculates to sixteen places of figures, but simultaneously prints the results. Specimens of the printing executed by this machine may be seen in the Swedish department of the Exhibition.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

ELECTRICAL MACHINES.

The most important philosophical instruments connected with electricity are those by which the various measurements of electrical quantities are effected. These are divided into strength of currents, quantity of electricity, electro-motive force and resistance of conductors. The most interesting electrical machine in the present Exhibition is that exhibited by M. Wesselhoft, Russia (14). It is the invention of Professor Töpler, of Riga, and acts on the principle of multiplying induction resulting from a series of glass plates rotating with great rapidity. This instrument is especially deserving of examination, and is a great improvement on Holtz's apparatus of a similar nature.

Electrical
machines.

Few philosophical instruments possess greater interest than those known as electro-magnetic. From the period when Oersted, in 1820, linked the sciences of electricity and magnetism together, and proved that the one acts upon the other, not in straight lines as other forces do, but in a direction at right angles, so that, by ultimately making and destroying the action of magnetism, a moving power can be obtained capable of mechanical application, great expectations have been entertained that these forces would admit of useful practical application. But hitherto no electro-magnetic machine has been constructed at all capable of competing successfully with the steam engine. P. Dumoulin-Froment, France (83), exhibits a machine of this kind, but it is more in the nature of a toy than a machine of practical utility. But Oersted's discovery of these electro-magnetic laws has been turned to signal advantage for astronomical purposes. The Americans were among the first to apply these laws in the deter-

Electro-
magnetic
machines.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

mination of the difference of longitude, and W. Bond and Son, United States (4), exhibit an astronomical clock and chronograph which was used for ascertaining, in connection with the Atlantic cable, the difference of longitude between Newfoundland and Valentia. France contributes grand magneto-electrical apparatus. That of Nollett's, exhibited by Ruhmkorff, France (1), constructed for the Ecole Polytechnique, and his inductive apparatus for converting dynamic into static electricity, are especially worthy of being attentively examined.

General Morin (not in the catalogue) exhibits a very ingenious apparatus for registering minute variations of temperature by means of a thermo-electric pile. The apparatus is composed of fifteen brass rods and the same number of iron ones, so disposed as to constitute a thermo-electric pile of fifteen couples. If we suppose one of the soldered points of junction of the two metals to be kept at a constant temperature—the freezing point, for instance—then another junction being situated in a given medium at another temperature, a current will be excited in proportion to the difference. The existence of this current is made apparent by the deviation of a magnetic needle, the electric fluid previously passing through the bobbins of a common multiplier. The needle itself is suspended by a silken thread. Let us now suppose the needle to be situated in the plane of the magnetic meridian, and to be provided with a vertical shaft proceeding from its centre and supporting a copper needle at its lower end. As copper is non-magnetic it cannot exercise any influence on the desired result, and being parallel to the iron needle, and consequently in the same vertical plane with it, it will strictly indicate the same deviations. A horizontal disc of white paper situated under this copper needle, and supported by a vertical shaft made to revolve by clock work, completes its entire revolution in the course of one hour, being, in fact, neither more nor less than a dial plate, which, instead of being fixed and provided with moveable hands, as in a common watch, or rather chronometer, is itself movable round a fixed hand which is represented by the copper needle. The latter has a sharp vertical needle-point fixed at its lower surface. At the expiration of every quarter of an hour the paper disc suddenly springs upwards, meets the sharp point, and is pricked by it. This mark will show what was the position of the needle at a given hour; and as this position marks the degree of the intensity of the current, which is itself but an exponent of the temperature of the medium under consideration, it follows that by this contrivance the variation of temperature

which has taken place in the course of one quarter of an hour is registered. It will, of course, be understood that the paper disc returns to its ordinary level as soon as it has received the mark of the needle. The performance of this novel and ingenious apparatus is stated to be highly satisfactory.

W. Ladd, United Kingdom (not in catalogue), shows a very ingenious electro-magnetic machine, with a new application of the principle of augmenting indefinitely the power of an electro-magnet by currents produced by itself. The apparatus can be used for lighthouse and other purposes, and is driven by a one-horse power steam engine, by which force effects are produced equal to a fifty Grove's battery.

It may not be out of place to state here that electricity is likely to receive many new and important applications in the arts, one of which is the refining of sugar. While, by means of an electro-magnetic machine, a current of electricity may be made to produce its equivalent of mechanical power, so, by a reverse process, mechanical power may be made to produce electricity. It has been found by experiments that a stream of electricity derived from a powerful electro-magnetic machine driven through a solution of brown unrefined sugar will bleach it, electricity being thus made to perform the function of charcoal. It appears that one of Wilde's electro-magnetic machines, driven by a 15-horse-power engine, has been set up for this object in a sugar refinery in Whitechapel.

Under the head of electricity may be included chronoscopes and chronographs. These instruments are chiefly applied to the measurement of the velocity of projectiles by electricity, and for registering the exact moment at which an astronomical or other observation is made. The chronoscopes shown by E. Hardy, France (91), constructed for the French Government, are the best instruments of the kind in the Exhibition.

Chrono-
scopes.

The instruments used for the automatic regulation of the carbon electrodes of electric lamps are extremely interesting. England is not represented in this department as she was in 1862; but France, in the exhibition of V. Serrin's (41) extremely beautiful and ingenious apparatus, now used in many of the French lighthouses, is admirably represented. The apparatus has been greatly improved since 1862, and the automatic regulation of the charcoal points is now under the most perfect control. The intense nature of this light is such that it has been used with great success in obtaining photographs of the catacombs under Paris, and of the sewers, specimens of which may be seen adjoining M. Serrin's exhibition.

Lighthouse
apparatus.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &C.
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J. Kravogl, Austria (6), exhibits the model of an electro-magnetic machine, combining some new principles; and, although not included in the catalogue, it may be desirable to state that our War Office has sent to the Exhibition Mr. Wheatstone's ingenious magneto-electric apparatus for firing guns.

An apparatus for engraving by means of electricity, exhibited in the machinery department of the Exhibition, though not included in the class of philosophical instruments, may be incidentally noticed. It is extremely ingenious and illustrates in a very forcible manner the great activity of mind now devoted to utilising electricity.

The applications of electricity to telegraphy are abundantly illustrated in the Paris Exhibition, but the examples appertain to another class (64), and that of electricity to clocks to class 23.

Galvano-
meter.

Elliott Brothers, United Kingdom (13), exhibit Sir W. Thomson's astatic reflecting galvanometer used in laying the Atlantic telegraph cable; and P. H. Desvignes, United Kingdom (11), a gyroscope which revolves by electro-magnetism.

There is a fine exhibition of glass tubes for showing electricity in vacuo and in various highly rarefied gases. Those exhibited by C. H. Seguy and Ruhmkorff, France (38 and 1), and by H. Geissler, Prussia (1), are the most varied and interesting.

G. Trouvé, France (8), exhibits various ingenious automatic toys, such as humming birds, small gyroscopes, heads of animals, &c., set as pins, which move by magneto-electricity.

MISCELLANEOUS PHILOSOPHICAL INSTRUMENTS.

Miscella-
neous philo-
sophical in-
struments.

Under this head the following deserve notice:—Bourbouze, France (48), who shows an ingenious apparatus for determining the laws of falling bodies, their friction and rigidity; L. G. Perreaux, France (31), an ingenious instrument for ascertaining the elasticity and strength of wires; G. A. Hirn, France (16), apparatus for measuring the dynamical force of torsion in working machinery; M. Chuard, France (38), a new safety lamp for mines; General Arbuckle, United Kingdom (2), a pyrophylax, or automatic apparatus for giving notice of a fire; C. Wheatstone, United Kingdom (not in catalogue), cryptographs for secret writing, used by the War Office; F. Wedel-Jarlsberg, Sweden (7), a self-registering compass; S. E. Morse, United States (15), a bathometer for measuring the depth of water; and a very beautiful screw-cutting lathe, exhibited by R. and J. Beck, which

Screw-cut-
ting lathe.

may be considered as perfect of its kind. It is worthy of remark that, while the precise origin of the lathe is unknown, though it may be traced to the potter's wheel of the remotest times, the plan of an extremely ingenious self-acting saw mill moved by water-power may be seen in a MS. of the thirteenth century, preserved in the Bibliothèque Impériale, Paris, and is probably of much earlier date. Turning by the lathe was long a favourite pursuit in France with amateurs of all ranks, who seem to have spared no expense in the perfection and contrivance of elaborate machinery for the production of complicated figures. This taste continued at least up to the great French Revolution, and contributed in a very high degree to the excellence of philosophical instruments. Indeed, the constructive machine most perfect in its action, whether as regards the best manner of using dynamical power or the expeditious performance and the good quality of the work done, is certainly the lathe, and great credit is due to Messrs. Beck for the improvements they have made in that devoted to screw-cutting.

COLLECTIONS, MODELS, AND DRAWINGS FOR TEACHING
THE PHYSICAL, NATURAL, AND MEDICAL SCIENCES,
ANATOMICAL PREPARATIONS, &c.

Under these heads the Paris Exhibition contains a vast amount and great variety of subjects. Among the most important are I. Epkens, Prussia (16), who exhibits a fine collection of models for teaching geometry, prepared under the direction of Professor Plücker, of Bonn; A. Krantz, Prussia (17), models of crystals; J. Schroeder and the Industrial Society of Hesse, Grand Duchy of Hesse (1 and 3), a magnificent collection of instruments and models for teaching the physical sciences, geometry, and mechanics; H. Meidinger, Grand Duchy of Baden (4), models in pasteboard of various machines; G. A. Lenoir, Austria (8), various models of scientific apparatus; A. Franchini, Italy (26), instruments and apparatus for teaching the physical sciences; Central High School of Engineering, Italy (48), coloured models in wood of crystals; Royal School of Engineers, Italy (51), models of mechanical machines; workshops of Boulik, Egypt (1), instruments and models for teaching mechanics; Province of Para, Brazil (1), geometrical models in wood; E. Flonck, France (62), an extremely beautiful model of a locomotive engine; J. Silbermann, France (93 and 108), oil paintings illustrating various physical phenomena; and P. Lackerbauer, France (99), water-colour drawings, and lithographs illustrative of natural history. The most remarkable natural history, botanical, and geological collections are E. Mocquery's, France (107),

Collections
and models
for technical
instruction.

Natural
history
collections.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &C.

who exhibits a large collection of useful and noxious insects; E. Verreaux, France (110), humming-birds, their skeletons, nests, and eggs; Pattier, Climatological Society of Algiers and Icard, Algeria (1, 2, 3), plants, flowers, and seeds, from Algeria; A. Krantz, Prussia (17), geological collections from the vicinity of Bonn; R. Brendell, Prussia (23), models of flowers for teaching botany; G. L. Lundqvist, Sweden (11), collection of insects found in Sweden; E. C. Schübeler, Norway (6), botanical collections from Norway; A. Strauss, Russia (13), botanical collection from the vicinity of Moscow; Academy of Sciences, St. Petersburg, Russia (15), models of aerolites which fell in Russia; A. Cerato Italy (55), vegetable and animal fossils from Bolca and Lumezzane; Royal Technical Institution of Florence, Italy (60), geological collections from Elba; J. Sequenza, Italy (63), palæontological collections from the province of Messina; A. Sacchi, Italy (65), collections of minerals from Vesuvius; P. Parlatore, Italy (68), botanical collections and wax models of the vine disease; A. Targioni, Italy (90), zoological collections; Abdullah Bey, Turkey (12), a very remarkable and complete collection of shells, marine plants, fossils, and insects from the Bosphorus, and various preparations showing diseases of plants. These collections, extending to above 3,000 specimens, have been made by Abdullah Bey, better known in the scientific world as Karl Hammerschmidt, his original German name. He entered the Turkish army some years ago, in which he still serves as a chief medical officer. He has devoted all his leisure time to natural history, especially with the view of founding a museum in Constantinople, for which the above collections were made; but although the Sultan has authorized the establishment of such an institution, and nominated Abdullah Bey director, the want of funds has prevented the design being carried out.

Dr. Reil, Egypt (class 12), palæontological collections from the vicinity of Cairo, and specimens of small shells (*Cyproeamonetaria*) used as money in parts of Africa.

Chamber of Arts, Canada (2), stuffed birds for the study of natural history.

C. J. S. Bethune and F. Passmore, Canada (3 and 4), collections of insects and fish.

Anatomical
prepara-
tions.

The most remarkable objects under the head of medical and anatomical preparations are those exhibited by L. Auzoux, France (98), models in wax, especially that of the human brain, showing the course of all the fibres, the muscles of a gorilla, horse, &c.; and the anatomy of various animals and structure of plants. Dr. Auzoux also exhibits the elaborate anatomical preparation, in wood, of a man, executed by the

celebrated Fontana, of Florence, in 1799, by order of the first Napoleon, and for which Fontana received 80,000*f*. P. N. Vasseur, France (81), also shows admirably executed anatomical models, in wax and plaster-of-paris, of the human body. Dr. J. Hyrtl, Austria (4), exhibits excellent anatomical models; especially deserving of attention are those showing the bony structure of the organ of hearing among animals; and A. Hartkopff, Sweden (13), exhibits delicately-executed anatomical specimens in wax, among which the structure of the gorilla is highly deserving of notice.

Dr. Brunetti, Italy (75), contributes a large collection of anatomical preparations of the human subject and of various animals, showing the structure of the organs and tissues. The *modus operandi* of the exhibitor is a secret; but in a publication on his preparations he states that the process does not occupy more than thirty hours at the utmost. The preparations are in all cases lifesize, and are unaffected by time or insects. To the student in anatomy this discovery promises to be of great use, the parts being so well preserved as to enable them to be examined microscopically. Montesinos y Capo-Justo, Spain (3), exhibits a very ingenious and well-constructed anatomical bust in plaster, and Dr. F. Schübelers, Norway (6), a fine and extensive collection of plants from that country.

The weights, measures, and coins of various countries are pretty fairly represented. The most extensive exhibition is that made by the Imperial Commission, who have obtained standard specimens of the weights, measures, and coins of different nations. They will be found conveniently arranged in the pavilion in the central garden. In drawing attention to the collections under the above heads, which will be found here and elsewhere under class 12, the reporter cannot forbear from advertng to the confusion and discordancy which characterise the systems of weight and measure at present in customary use among civilised nations. Not only does the authorised system of each country (except those which have adopted the French metrical system) differ from that of every other country, but, as may be seen in the present Exhibition, particular provinces and towns, in various countries, are allowed to adopt special standards of their own. Thus, in Turkey there are above fifty different weights and measures, which may be seen in that department; and in other countries similar want of uniformity prevails. It is, indeed, greatly to be desired that this terrible and most perplexing system should be reformed. Every investigator in the field of science can bear witness to the overwhelming labour involved in the numerous and

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

Weights,
measures,
and coins.

MR. WELD
ON PHILO-
SOPHICAL
INSTRU-
MENTS, &c.

lengthy calculations necessary to reduce to a common and comparable expression results recorded under systems of weight and measurement at once numerous and inconsistent. It will, assuredly, not be one of the least important results of the Paris International Exhibition if Governments generally should be led by it to adopt the simple and admirable metrical system of France.

In conclusion, it may be stated that if the philosophical instruments in the Paris Exhibition are not remarkable for any great novelty, they are eminently so for their general excellence. They also demonstrate in a very conspicuous manner the exertions that are being made by philosophers to compel nature, by means of self-registering instruments, to record her own facts. Mr. Charles Brooke's admirable and beautiful system for the photographic self-registration of natural phenomena has been extensively adopted with signal advantage to science; and, while in long past ages man knew no substitute for the replacement of manual exertions, scientific agencies are now called into play which, while greatly diminishing labour, largely add to the comfort and prosperity of the commonwealth. But while the labours of our philosophers in this department of science are great, it is to be regretted that more attention is not paid to the construction of models and instruments for technological instruction in general, with the view to their being exhibited in the principal cities and towns of the United Kingdom. While various Continental countries exhibit largely in this most important department, the United Kingdom is scarcely represented. This is the more to be lamented, because it is abundantly evident that the numerous schools and collections for teaching the natural sciences established during recent years on the Continent have been highly instrumental in developing and improving the arts and manufactures of foreign countries, which now in many respects rival, and even surpass, our own.

REPORT ON MAPS and GEOGRAPHICAL and COSMOGRAPHICAL APPARATUS.—(Class 13.)—By Lieutenant-Colonel COOKE, R.E., C.B.

LIEUT.-COL.
COOKE ON
MAPS, &c.

There is probably no class of objects on which less information is obtained by a universal exhibition than that which comprehends maps and plans. The reason of this is obvious, arising from their portability, cheapness, and the facility with which they can be multiplied, from which it results that no map of any importance is published in Europe which does not speedily find its way to the geographical establishments of every country.

Among the maps exhibited at the present Paris Exhibition, the most important are unquestionably those contributed by the different Governments. In all the countries of Europe, the necessity has been recognised of having a detailed and accurate map, which should be available for military and administrative purposes. The scales on which these surveys have been published have varied from about three inches to a mile to about three miles to an inch. First in point of scale comes the little electorate of Hesse, now politically extinct, the excellent map of which is published on a scale of 1 in 25,000 or about three inches to a mile. Belgium comes next, 1 in 40,000; then Baden, Bavaria, Sardinia, Holland, Wirtemberg, Oldenburg, Grand Duchy of Hesse, 1 in 50,000; Saxony, 1 in 57,600; Great Britain, 1 in 63,360 (afterwards increased to 1 in 10,560, and again to 1 in 2,500); Denmark, France, and part of Prussia, 1 in 80,000; Lombardy, Venetia, States of the Church, Tuscany, Parma, Placentia, Guastalla, 1 in 86,400; Hanover, Portugal, Prussia, Sweden, Switzerland, 1 in 100,000; Schleswig-Holstein, 1 in 120,000; Russia in Europe, 1 in 126,000; Austria, 1 in 144,000; Norway and Greece, 1 in 200,000. These surveys have been mostly executed within the present century, and many of them are still incomplete. The survey of Great Britain commenced by the measurement of a base line on Hounslow-heath in 1784. The new map of France was commenced in 1818. Belgium has been late in the field, only three or four sheets of the Government survey having as yet been published; but this want has not been so much felt owing to the fine map of the country by Vandermaelen which exists.

Government
maps.

The last country in Europe (excepting Turkey) to recognize the necessity of a Government survey was Spain, where,

LIEUT.-COL.
COOKE ON
MAPS, &c.

until lately, no commencement of such a work had been made; but, within the last two or three years, steps have been taken to remedy this defect, and a triangulation, conducted on the most scientific principles, has been undertaken. It was intended that the mapping of the country should have advanced *pari passu* with the triangulation; but, unfortunately, the political troubles in which Spain has latterly been involved have led to the suspension for the present of the whole of the survey operations.

In Turkey no Government survey exists; but this gap has been filled up by the great map of that country on a scale of 1 in 600,000 undertaken by M. Handtke, which is exhibited in the Prussian Court.

All these Government surveys have been based upon triangulations, conducted, for the most part, on the most elaborate and scientific principles. The ingenuity of mechanicians has been exhausted in planning instruments that shall measure base lines to the fraction of an inch. Instruments for celestial observations and for measuring angles have been devised by the best astronomers and opticians of the day, and the result has been a marvellous accuracy, of which an idea may be formed from the fact that in the English survey the difference between the length of a base line seven miles long in the north of Ireland obtained by actual measurement, and that which resulted from triangulation starting from a base in the south of England and carried over the whole of England and Ireland, was only *five inches*.

Measure-
ment of arc
of longitude.

The triangulation of the different countries has been connected together. The last link in the chain was completed in 1861-62 by the connection of the Belgian and English surveys across the north of France and the British Channel. This was effected by simultaneous but independent observations carried on by the French and English engineers. The remarkable agreement in the results may be seen in a table exhibited in the French department. By all these combined triangulations the earth has been clasped, so to speak, by an accurate network, extending from the Ural Mountains on the east to the extremity of Ireland on the west. From the data which this network affords it is proposed, with the assistance of the electric telegraph, to measure an arc of longitude of about 75 deg., which, in connexion with the numerous arcs of latitude already measured, will, it is hoped, assist in solving some important questions in connexion with the figure of the earth, and thus throw light on some of the points which are still obscure respecting the origin and early history of our globe. Already the difference in length of

the equatoreal and polar diameters has been measured with considerable accuracy; and glimpses have been seen of a very curious fact, pointed out by Sir H. James in his publication of the results of the comparison of the standards of length of different countries, which consists in an apparent ellipticity of the equator of the earth and a coincidence of the axes of the supposed ellipse with the meridians, round which are grouped the greatest portions of earth and water; but these results depend on quantities so small and so liable to be vitiated by the least error of observation or calculation that it is perhaps premature as yet to express a decided opinion upon the reliance to be placed upon them. The credit of the idea of making use of the surveys of Europe for the determination of a great arc of longitude is due to M. Struve, the great Russian astronomer.

LIEUT.-COL.
COOKE ON
MAPS, &c.

In connexion with the proposed measurement of an arc of longitude, another interesting operation has been carried out at the head-quarters of the Ordnance Survey of England, namely the comparison of the standards of length of different nations. It is obvious that in order to connect the measurements deduced from the triangulations of the different countries together, it is necessary to know the exact relative value of the terms in which they are expressed. The comparative value of the measures in use in different countries has always been known with sufficient exactness for practical purposes, but, when it became a question of dimensions involving several thousands of each of these measures, it is evident that a very small error in one would produce a very large error in the result, and it was therefore necessary to institute a much more rigorous comparison than any that had been before found necessary.

Comparison
of standards
of length.

The standard toises of Russia, Prussia, and Belgium were therefore procured from their respective governments and compared by the most scientific processes with the standard measures of the Ordnance Survey; the standard metre of France has already been compared with a platinum metre in the possession of the Royal Society. In order to make the operation complete the 10 feet standard bars of India and Australia were subjected to the same test, and the governments of Austria, Spain, and the United States were invited to send their measures for the same purpose. These operations, which require the highest refinements of mathematical science, were carried out under the directions of Sir H. James at the head-quarters of the Ordnance Survey by Captain Clarke, R.E., an eminent mathematician. The results were worked out to the hundred millionth part of a yard, and the difference thus ascertained, between the lengths

LIEUT.-COL.
COOKE ON
MAPS, &c.

of the different measures and those which had previously been generally accepted, were less than a ten-thousandth part of a yard.

The most complete exhibitions of Government maps will be found in the English and French Courts. The former country has taken the lead in many important operations connected with the survey, such as extension of scale, application of photography to the reduction of maps, introduction of photozincography, application of electroplating, &c.

It was found in England that the scale of one inch to a mile was not sufficiently large to make the maps available for many important operations in which maps are specially necessary: such as the commutation of tithes, apportionment of taxation, registry and transfer of property, &c. It was therefore determined to increase the scale to six inches to a mile, and subsequently to 25 inches to a mile, on which scale the ordnance survey of England and Scotland is now being carried on, and the resurvey of the whole of the south of England has been commenced on the same scale. The survey of Ireland on the scale of six inches to a mile is completed. The exact state of the survey of Great Britain and Ireland is shown in the catalogue of publications issued from time to time from the Ordnance Survey Office, and sold by their agents. Specimens of the English maps on all three scales are exhibited, and also of the sheets of the town survey on the scales of 5 feet and 10 feet to a mile.

Application
of photo-
graphy to
map mak-
ing.

When the larger scales were adopted, it was considered desirable to continue also the publication of the map of the kingdom on the smaller scales on which it had been commenced. For this purpose it was necessary to reduce the sheets from the larger scale to the smaller ones, a process very costly and liable to inaccuracy if performed by hand. In order to facilitate the reduction, the use of photography was introduced by Sir Henry James at the Ordnance Survey Office, Southampton, and this has now been adopted by the French and other Governments. By means of this art the maps are reduced with an accuracy and at a smallness of cost quite unattainable in any other way; specimens of the photographs showing their application may be seen in the English and French Courts.

Application
of electro-
plating.

The use of electroplating for the reproduction of copper plates was also, as far as is known, first introduced at Southampton. The application of this is twofold; first, to multiply the same plate so that, when one plate is worn out in course of time by printing, a fresh one may be substituted; and,

secondly, to reproduce a plate at a particular stage of the engraving, in order to make use of the second plate for showing different information from that which is given on the first one. An illustration of this is shown in the English Court, where two sheets on the scale of one inch to a mile are exhibited, on one of which the hill features are shown whilst on the other they are omitted. The object of this is to be able to supply impressions of the sheet without hill features for purposes where the greater clearness which results from the absence of those features is valuable—the electrotpe plate being taken from the original one before the hill features were engraved on the latter. In Austria this system has also been adopted to produce a road map of Bohemia without hill features, on a scale of 1 in 238,000. Specimens of the original copper plate, the matrix, and the resulting electrotpe plate are exhibited in the English and French Courts.

LIEUT.-COL.
COOKE ON
MAPS, &c.

In the court devoted to the Ordnance Survey, Sir H. James exhibits a projection of the sphere, which has the advantage of embracing two-thirds of its surface, the majority of projections being only capable of showing one half. It is, as is well known, impossible to represent accurately the curved surface of the earth on the flat surface of a map, and the ingenuity of geographers has been exerted in all ages in devising methods which shall give the best compromise between the inevitable inaccuracies. Thus, in the orthographic projection, whilst the circles parallel to the plane of projection are represented exactly, those at right angles to it are very much distorted towards the equator,* where countries are represented only one-fourth of their natural size. In the stenographic projection all circles are represented by circles, but the portions near the equator are much exaggerated in size, being the converse of the former case. In Mercator's projection the portions near the pole are enormously exaggerated, but this projection has a practical advantage, very valuable to the navigator, that the course of a ship can be laid down in a straight line instead of in a curve. In the globular projection the distances measured along the meridians are very nearly correct; those measured along the parallels are a little distorted; but, on the whole, this projection has been considered to give the best balance of errors, and is the one which, with some modifications, is generally adopted.

Projections
for maps.

Sir H. James's projection resembles most nearly the

* To facilitate description the plane of projection is assumed to be the equator.

LIEUT.-COL.
COOKE ON
MAPS, &c.

globular one. The point of projection, instead of being, as in the latter, at a distance of the sine of 45 deg. from the extremity of the diameter at right angles to the plane of projection, is at a distance of half the radius; and for this point the advantage is claimed, to quote the words of the author in an article in the *Philosophical Magazine* for April, 1862, that "the distortion of form, and the exaggeration of area, or as we may call these two defects of all projections, the misrepresentation, is a minimum; but, for extending the projection from 90 deg. to 113 deg. 30 min., Captain Clarke has shown that the distance of the point of sight to give the least misrepresentation should have been 11-30 instead of 15-30." The main feature of this projection, however, is that, instead of taking as the plane of projection a great circle passing through the centre of the sphere, the plane of a parallel at a distance of 23 deg. 30 min. from the centre is adopted. This alteration of plane does not affect the projection up to 90 deg., except to alter the scale of it, but it allows of a larger portion of the sphere, to the extent of about two-thirds, being shown. The advantage of this for certain cases is seen by one of the maps exhibited, in which the four magnetic poles are represented at once. The distortion towards the edges of this projection is considerable, but this must always be the case where more than a hemisphere is attempted to be shown.

Mr. Nelson also exhibits in the British Court some good maps on a projection, or rather development, for which he claims some novelty. A point is taken on the paper representing the pole of the sphere, and from this point lines, radiating on all sides, are drawn, representing the meridians and, on them, the actual distances, as measured on a globe, are laid off for the circles of parallel. This can be continued to the antipodes, so as to show the whole globe, but at the expense of enormous distortion. Mr. Nelson, proposes as a modification of the projection, to diminish the distances between the parallels in the proportion of their elongation, so as to preserve the areas the same.

This projection does not appear to differ from the "Equidistant Zenithal" one, which has been known since the sixteenth century, and is supposed by some to have been used by the Egyptians. The projection admits of numberless modifications, either to equalize the areas, as proposed by Mr. Nelson, or to modify the errors according to any law that may be proposed. To attempt to apply projections or developments of this nature to any portion of the sphere much exceeding the half appears to be practically useless, as the distortions are so enormous. M. Petermann has sug-

gested a method, which consists in opening out the second hemisphere in segments, by which means, if the segments are properly selected, the countries can be shown without much distortion, but with a total loss of their relative position towards the antipodes.

LIEUT.-COL.
COOKE ON
MAPS, &c.

Before leaving the court devoted to the Ordnance Survey, mention must be made of two very remarkable publications exhibited there—a photozincographic facsimile of “Domesday Book” and the “Ordnance Survey of Jerusalem.”

“Domesday Book” was made by order of William the Conqueror in 1086. It contains a description of the owners and inhabitants of every manor, hundred, village, &c., in England, with the exception of Northumberland, Cumberland, Westmorland, and Durham, and an estimate of the area of the lands and the nature of their cultivation. Besides its value as an ancient historical document, it is of great interest as showing the ownership of the country at that remote period. A copy of “Domesday” was published at the end of the last century at great cost, but the type was destroyed accidentally by fire, and the copies are very rare and expensive. By the art of photozincography an exact facsimile has been reproduced at a comparatively small cost. It is sold by counties at prices varying from 8s. to 1l. 3s.

Domesday
book.

The art of photozincography or photolithography was discovered simultaneously at the Ordnance Survey Office of England by Captain A. Scott, R.E., and Colonel Sir H. James, R.E., and at the Surveyor-General's Office, in Melbourne, Australia, by Mr. Osborne, in 1859–1860. Its essential features are the following:—A photographic negative of the map or drawing to be reproduced is first made. A positive print is then taken on paper prepared with a solution of gelatine and bichromate of potassia, mixed with lithographic ink. The effect of the light on this solution is to render it insoluble; therefore, after the print has been taken, those portions which were protected from the light can be washed away, leaving intact the remaining insoluble portions which correspond to the lines of the map or drawing. This can then be transferred at once to zinc or stone, and printed from in the same way as if the plan had been drawn on lithographic transfer-paper. Thus, a plan which it would take weeks or months to copy by hand for lithography can, by this process, be executed in a few hours, and with a fidelity which no copyist could hope to rival. This process is being adopted on the continent, and in the Prussian Court will be found specimens of photolithographs of relief maps in which half tints—the great difficulty of the process—are shown. They are exhibited by W. Korn and Co., Photolitho-

Photolitho-
graphy.

LIEUT.-COL.
COOKE ON
MAPS, &c.

Survey of
Jerusalem.

Institut., Berlin, and by the Photolith. Institut. of Kellneh and Giesemann, Berlin.

The survey of Jerusalem was made in 1864-5 by a party of sappers under Captain Wilson, R.E., who were detached for that purpose from the Ordnance Survey of England. The funds were provided by Miss Burdett Coutts and others, the special object being to afford a basis on which to work for improving the sanitary condition of the city, especially as regards drainage and water supply. This survey has been conducted with all the accuracy of the Ordnance Survey of England; and thus, for the first time, a map of the holy city has been produced that can be relied on with certainty in discussing the localities and events connected with its history, which are of such deep interest to the whole civilised world. The map is accompanied by photographs of different parts of the city and neighbourhood, which were taken whilst the survey was in progress, and also by photozincographs, in which half tones are very well shown. During the course of the survey the ancient aqueduct from Solomon's Pools, which supplied the city with water, was traced. It is a work of the highest engineering skill, and in so good a state of preservation that, at very little cost, it has been put into such a state of repair that water has actually been again conveyed through it for the use of the city. In connection with this survey a line of levels was also run between the Mediterranean and Dead Seas in order to settle accurately the much vexed question of the amount of depression of the latter below the former. The result showed it to be 1290 feet.

Correcting
copper
plates.

In the French Court is exhibited a method of making corrections on copper-plates, which was invented by M. George, of the French Dépôt de la Guerre, and is used in that office with great success, a saving in cost of 90 per cent. over the method usually adopted being claimed for it. The ordinary plan of making corrections on a copper-plate is to scrape the surface with a sharp instrument until the work is removed and then to bring the surface thus lowered up to the level of the rest of the plate by hammering the back. In M. George's process the plate is covered with a resinous coat, and the part required to be altered is removed with a sharp instrument. The plate is then put into an electroplating bath and a deposit thrown on to the lowered portion, the remainder being protected by the resinous coating. The deposit is continued until the portion which was scraped away is raised a little above the rest of the plate. It is then scraped level and the new work inserted.

Specimens of the manuscript hill sketches, from which the

features are engraved on the maps, are exhibited in the French and English Courts. Those in the former are represented by continuous contour lines, and afford a good illustration of the effect which may be produced by that method.

LIEUT.-COL.
COOKE ON
MAPS, &c.

Among the French Government maps exhibited must be mentioned a very beautiful map of France by the "Commission Spéciale Institutée au Ministère de l'Instruction Publique d'après les ordres de S. M. l'Empereur," on one copy of which the mountains and river systems of France are shown, and on another the sites of ancient remains up to the time of the Roman Conquest.

Photographs of models of French mountains, which are being made at the Dépôt de la Guerre, are exhibited. The models are exceedingly well executed, and it is to be hoped that they will find a place in the Exhibition before it closes.

In the court appropriated to Holland, Colonel Besier, Director of the Topographical Department of the War Office in that country, exhibits a very pretty map, executed in chromolithography by what appears a very ingenious process. A photographic negative of the map to be reproduced is taken. The surface of a lithographic stone is sensitized, by what method is not stated, but probably by means of bitumen of Judæa or of bichromate of potassia and gelatine. The stone is then printed from the negative in the same way as if it were the ordinary sensitive paper. This process is repeated on as many stones as are necessary for producing the colours required, thus ensuring on each stone impressions actually identical, which is an important point to ensure the correct fitting of the colours. Colonel Besier employs three stones, blue, red, and yellow, with which he produces all the requisite combinations of colour. The necessary portion of the work is then engraved on each stone. In order to produce shades of colour the following ingenious process is adopted. The outlines on the colour-stones are inked and their surfaces protected from the action of acid by a thin coating of asphalt; through this fine lines are cut by a ruling machine, so close together as to present the appearance of a tint. Those parts which are to remain white having been protected by a coating capable of resisting acid, a weak solution of acid is poured upon the stone, which, on the parts which have not been protected, produces, by slightly eating in the fine lines, a light tint. Those parts where the light tint is wanted are then protected, and the acidulation proceeded with until the darkest tints required have been obtained. The writing is stamped from type set up in small boxes and inked with transfer ink on a paper print

Colonel
Besier's pro-
cess.

LIEUT.-COL.
COOKE ON
MAPS, &c.

from the negative, which is then transferred to the stone. The effect of the map is very pleasing, and the fitting of the colours remarkably good. Whether the process will ever be extensively used must depend on its cost, and on the facility of producing large maps by means of it. Colonel Besier has invented a machine capable of ruling the lines automatically.

The plans exhibited by the other Governments of Europe will be found in their respective courts. It is not necessary to make any special mention of any of them except of those of Austria and Switzerland.

In Austria the representation of the hill features of the country on maps has always been a subject of special study, and the result may be seen in the beautiful maps exhibited by the K. K. Militairisch-Geographischen Institut, which is a Government department under General de Fligely, and with which is associated the name of Lieut.-Colonel Scheda, who exhibits a beautiful map of Europe, and a general map of the Austrian Empire, which, for delicacy and minuteness of execution, has, probably, never been excelled. In fact, it perhaps rather errs in excess in those qualities as, in some of the mountainous sheets, such as those of the Tyrolese Alps, the detail is so minute that it can hardly be read without a magnifying glass. These Austrian maps are exhibited in the circle which is next to that devoted to machinery.

In the Swiss department is exhibited the beautiful map of Switzerland by General Dufour; perhaps, on the whole, the most effective one in the Exhibition. It rivals the best maps exhibited by the other Governments in point of execution, and it has the advantage of being complete, and of representing the most picturesque kingdom in Europe. The general harmony which runs through the whole is very much to be admired. The great glacier ranges which border the depression in which run the Rhone and the Rhine stand out as if in relief, and the gradation to the softer features of the valley of the Aar is beautifully shown. The mountains are treated in a somewhat conventional way, and the higher portions of the ranges are evidently not put in from actual survey; but this, in so rugged a country, was probably undesirable, if not impracticable, and the want of minute detail has perhaps added to the effect by allowing of a bolder handling of the mountain ranges.

Among Government surveys that which is in progress in India must not be omitted. It is on a scale of four miles to an inch, and the triangulation has been executed with the utmost refinements of science. The explorations in con-

nection with it in the Himalayas and the adjoining little-known regions of Central Asia are of the highest interest. The only sheets exhibited are those of the Revenue Survey, which is a distinct branch in connexion with the Trigonometrical Survey.

LIEUT.-COL.
COOKE ON
MAPS, &c.

In many countries geological and hydrographical surveys have been undertaken by the respective Governments. Sheets of the former are exhibited by England, France, Prussia, Austria, Bavaria, Norway, Canada, and Victoria. Charts are exhibited by England, France, the United States, and Sweden.

* In Great Britain, France, and most other maritime countries, a special department exists for conducting the maritime surveys of their own shores as well as those of other countries to which navigation and commerce have extended, but whose Governments have not the means of making such researches for themselves.

Hydrogra-
phical
surveys.

The coasts of Great Britain and Ireland have all been minutely surveyed on scales varying from two to six inches to a mile; these surveys are based on the trigonometrical points of the Ordnance Survey, the coast features to low water and the soundings up to 100 fathoms or over, being executed by the Nautical Surveyors who are naval officers. All the surveys executed by the English Admiralty are engraved on copper, and in cases where there is an extraordinary demand for a particular chart, the plate is faced with steel for greater durability.

It was only to be expected that a maritime country like Great Britain, in addition to the surveys of its own shores, should furnish an extended series of charts, both original and published, embracing various portions of the globe, in the most distant regions of which her surveying ships are always to be found, hence we find exhibited charts of the Mediterranean, the West Indies, Australia, the Cape of Good Hope, Vancouver's Island, the Coral Lagoons of the Pacific, and the ice drift of the Southern Hemisphere.

The aim of the Hydrographic Department of the Admiralty, however, has been to show in this Exhibition the nature of its labours rather than the great extent of ocean and land that it covers.

This may be exemplified by the exhibited chart of one of the many now in process of being resurveyed on the

* The information on hydrographic surveys has been supplied by Captain Richards, R.N., Hydrographer to the Admiralty, and Juror for Class 13.

LIEUT.-COL.
COOKE ON
MAPS, &c.

home shores, namely, that of the entrance of the River Thames; of these are given;—

1st. The network of soundings as actually obtained in the deep water channels, and over the submarine banks.

2nd. The drawing of the same locality with the channels and banks contoured and all the necessary information for the mariner as arranged by the surveying officers.

3rd. The finally engraved work as it has again been added to by the experience and collected information of the Hydrographic Department, a work inexpensive in its character and forming not only the most useful guide to the seaman, but affording minute, accurate, and invaluable details to the engineer for hydraulic and other work.

The French Government have a hydrographical establishment, somewhat similar to that of Great Britain, though not so exclusively a nautical establishment. It is presided over by a naval officer of high rank, and with its naval members are associated hydrographical engineers, who generally conduct the triangulation of the coasts.

The French Government make the most accurate and elaborate surveys of their own coasts, and produced at the Exhibition some very fine specimens of engraved charts.

Few other maritime governments were exhibitors of nautical charts, although Russia, the United States, and Spain have extensive hydrographic establishments, and Italy is following in the same direction. The coast surveys of the United States are not exceeded in accuracy and beauty of engraving by those of any other nation.

The cause of there being so few exhibitors of nautical charts, in comparison with those of topographical and geological maps, is not difficult to account for. The practical value to navigation of every new nautical work is so great and the call for it so immediate, that it is universally distributed as soon as published and so requires no exhibition to bring it into notice; it is indeed an invariable rule with nearly all maritime nations to exchange annually all charts or other nautical works which each has produced.

Maps by
private pub-
lishers.

Something must now be said of the maps exhibited by private individuals. These do not present the same points of scientific interest as the Government surveys, and those which are of any importance are so well known to geographers that it will not be necessary to say much about them.

British map-makers, owing probably to our insular position, have not had to meet any general demand for maps of Europe on large scales; they have, therefore, confined their principal publications to general maps of the different parts

of the world. Under this head Mr. Stanford exhibits his beautiful library series of maps of the five great divisions of the earth, which in point of design and execution leave little or nothing to be desired. They are compiled by Mr. Keith Johnston, the well-known Scotch geographer.

LIEUT.-COL.
COOKE ON
MAPS, &c.

A very interesting model of the volcanic district of Auvergne, showing the flow of the lava-current, is exhibited by Mr. Wyld, well known in England for his models of ground, of which there are specimens in the Royal United Service Institution and in the Woolwich Rotunda. Mr. Nelson's projection has already been alluded to.

Whilst in England there has been no demand for maps of Europe on a large scale, in Germany the case has been different. The kingdoms and states of central Europe have all got their surveys, but these are generally limited entirely to their own territories, and differ in scale and projection, so that those of coterminous countries cannot be used together. These countries are, however, very much intermixed, so that, for the requirements of those who use maps, the necessity arose of producing such as should comprise large areas irrespective of political divisions. In military history especially, a department of literature in which the Germans have always been famous, maps on a sufficient scale of extensive portions of country are essentially necessary. This want has been very efficiently supplied by continental geographers; and it is especially to Berlin, Gotha, Vienna, Weimar, and Glogau that we must look as the great centres of European map-making. There we find among publishers Justus Perthes, Schropp, Reimer, Flemming, &c.; and among the makers of maps Petermann, Ritter, Kiepert, Reymann, Berghaus, Handtke, Scheda, &c.—constituting an assembly of the most scientific geographers of the day. The custom prevails in Germany of keeping distinct the occupation of map-publisher and of map-maker; thus, Perthes publishes the productions of Petermann, Stieler, Berghaus, &c.; Flemming, those of Reymann, Handtke; Reimer, those of Kiepert, &c.

In the first rank of publishers stands Justus Perthes, of Gotha. He exhibits, in the Prussian Court, the "*Mittheilungen*," edited by Dr. Petermann, which may be considered the great reportery of modern geography. Here will be found the latest geographical information from all parts of the world—from the North Pole, from the sources of the Nile, from Abyssinia, from Asia; wherever, in short, travellers are prosecuting explorations, their results, by the indefatigable labours of the editor, find their way into the pages of the "*Mittheilungen*." Perthes also exhibits a collection

LIEUT.-COL.
COOKE ON
MAPS, &c.

of maps, the works of Berghaus, Stieler, and others, amongst which is Stieler's atlas, and a beautiful little map of the world, by Berghaus, showing the currents of the ocean, great commercial routes, &c.

In the same court Flemming exhibits Reymann's great map of Europe, which comprises a larger area on a greater scale than any map, not a Government one, that has yet been published. It is invaluable to the military student for following the detailed operations of war. Dietrich Reimer, of Berlin, exhibits a map of Europe and others by the celebrated geographer Kiepert. An excellent map of the Prussian States, by Liebnow, is also exhibited, made by order of the Prussian Minister of Public Works. Good globes by Reimer and others may also be seen in this court. The photolithographs exhibited have already been alluded to.

Many other excellent maps by private publishers will be found in the different courts, but there is nothing in them that calls for particular notice.

Map of Suez
canal.

In the French Court and in one of the Egyptian detached buildings in the park is exhibited a very interesting map of the isthmus of Suez, showing the proposed canal, published by Andriveau Goujon, of Paris. In the Egyptian building the map accompanies an exceedingly well executed model of the country through which the canal passes, and excellent models of the works in connexion with it are also exhibited. The latter will probably be fully treated of in the section devoted to civil engineering; but a short account of the progress of the canal is necessary to make the map and model of the ground intelligible. It must be borne in mind, in the first place, that the map and model show the works, not as they are, but as they will be when completed. They consist of two distinct portions, a freshwater and a maritime canal. The former is about 6 feet deep and 50 feet or 60 feet broad at the top, with shelving sides. It starts from the Nile at Cairo, runs in an easterly direction as far as Lake Timsah, which forms a portion of the maritime canal, and then, bending to the south, terminates at Suez. This canal is completed. Its object is to supply with fresh water the labourers and machines employed on the maritime canal, and also to afford to the town of Suez a plentiful supply of fresh water, which was much wanted.

The maritime canal is still very incomplete. It starts from Port Said, on the Mediterranean, and is to traverse the isthmus to Suez, with sufficient works at its extremities to form good harbours in both seas. Its breadth is to be 100 metres (rather more than 100 yards) at the level of the water, and its depth about 26 feet. The portion between

Port Said and Lake Timsah, which is about half way between the two seas, is so far advanced that barges towed by steam-tugs can traverse it to Lake Timsah, where by means of locks, they are placed on the freshwater canal, by which they can reach Suez. Thus there is actual water communication from sea to sea; but before the fleets of the world can be transported across the isthmus much time must elapse, and a vast amount of money must yet be expended. The cost of the works up to this time is said to be 9,000,000*l*.

LIEUT.-COL.
COOKE ON
MAPS, &c.

It will be interesting to geographers to know that in the Bavarian Court are exhibited a series of views in Central Asia, by the well-known travellers Hermann, Adolphe, and Robert de Schlagentweit.

The United States do not as yet possess any scientific survey of their vast territories. Their maps, as a rule, are of a very practical character. They do not aim at any nicety of execution, but are remarkable for cheapness, and are somewhat gaudy in colouring. Johnson's atlas, which is exhibited in the United States Court, is a good type of the class. A globe on which a great deal of information is accumulated is also exhibited in that court by Schedler.

In the map department the British colonies are well represented. In countries, such as they for the most part are, thinly inhabited and partially undeveloped, we must not look for the highly finished maps of older nations, but we must be satisfied if such are produced as will suffice for the wants of settlers and travellers.

Colonial
surveys.

In Canada the Government survey devotes its resources to mapping the comparatively unknown parts of the colony, so as to keep pace with the wants of the settlers. A very excellent geological survey, of which sheets are exhibited, is also in progress in this colony under the direction of Sir W. Logan. In connexion with this survey is exhibited a fine specimen of the *Eozoon Canadense*, for the discovery of which the world is indebted to Sir W. Logan and his associates, and which is unquestionably one of the most remarkable geological discoveries of the day, as it carries back our knowledge of the existence of animal life on the earth for a period whose magnitude it is difficult to express. This specimen comes before the world at a very fortunate moment, when the disputed question of its animal origin seems to be set at rest by the discovery, which has just been announced to the Geological Society of England, of specimens which differ totally from each other in mineral composition, which fact seems fatal to the rival theory that

LIEUT.-COL.
COOKE ON
MAPS, &c.

the apparent animal organization of the Eozoon is due to crystalline or dendritic action.

In the Canadian department is exhibited Bouchette's map, which is a work of great merit and may be considered as the parent of the maps of British North America. A very well-executed model of the School of Agriculture of St. Anne, made by the students, is also exhibited.

A large and well-executed map of Natal, by Captain Grantham, is exhibited by the Surveyor-General; and also a very interesting series of maps by Dr. Mann, showing the physical features, climate, and productions of that rich but as yet little developed colony. These are exhibited in the machinery circle.

A good map of Mauritius, in chromolithography, is exhibited by Dardenne; and also some very interesting maps and reports on cyclones, the result of many years' observations, by M. Bosquet.

Victoria exhibits sheets of their admirable geological survey, by Selwyn; and in Queensland, an atlas of maps by the Surveyor-General is exhibited, which, as the production of the youngest of our colonies, is deserving of much praise.

REPORT on FANCY FURNITURE.—(Class 14.)—
By J. H. POLLEN, Esq.

MR. POLLEN
ON
FANCY FUR-
NITURE.

The following report was founded on the decisions of the united juries of Classes XIV. and XV. Some trifling divergencies will be found in the criticisms offered in regard to certain sections, from these decisions as they finally issued. This leads me to make certain statements of opinion on the working of international juries, that would have been out of place in the report when first published in the public papers.

I cannot say that experience tends to convince me that international juries are altogether satisfactory tribunals for such exhibitions as the present, where each nation watches jealously the success of its own exhibition, and when the competitors are *living and present on the scene*. Mixed juries begin with severe canons of criticism, and end, but too frequently, with diplomatic considerations. Medals are granted on these latter motives, when they would be refused on strictly critical principles.

Preliminary
remarks on
jury work.

It is impossible to find fault with indulgencies of this kind. They are found to be absolutely necessary.

There are often great merit and exceptional vigour and enterprise shown by states or by exhibitors whose means are very limited. Encouragements must be offered to such exertions and sacrifices, and there is but one way of doing so. Then, however complete the harmony among any special jury, and my own was singularly happy in this respect, there is a natural emulation among the contributing nationalities and their representatives, each of whom desires not only to *be*, but to be *seen* by visitors to be successful in a quasi-competition.

I do not know whether national juries could be organized which should make their awards in each country, and so avoid the international deliberations, or whether some other function could not be assigned to these mixed bodies.

I think that gradations of medals are a difficulty. In Paris the gold or first-class medals were at first limited to 100. This made a proportion of one and a half or so to each class; or, assuming that some classes would not rise to the importance of a claim on these rewards, two medals, or two and a half to a class. The number, *after our juries had*

Number of
gold medals.

MR. POLLEN
ON
FANCY FUR-
NITURE.

made their awards, was increased to a total of 900, and, in the case of our united classes, to some 18 or 20 gold medals. I think this number was too small, while the four or five we first awarded between the classes was a better number, if even this was not too large. It is possible to award *one first medal to a class, difficult to give two, and a score are too few*; for after two or three first-rate exhibitors out of 1,200, there are likely to be 50 or 60 nearly on one level.

The uncertainty as to the possible increase in the number of first-class medals issued in the most divergent principle of awards in different classes. Limited numbers of exhibitors in manufactures of slight importance having been recompensed by thrice the proportion of first-class medals as compared to our numerous united class.

No uncertainty should ever be allowed as to such an important element of encouragement, nor should particular juries have any voice in making claims for their own class out of an uncertain quantity of rewards, perhaps in ignorance of the action of other juries.

It is very important to mark the highest efforts of national industry, and still more to avoid wounding susceptibilities, of which we may judge by the dissatisfaction so generally felt at our own annual exhibition of pictures, not only when works are refused, but even by the decisions of the hanging committee.

Want of
preliminary
selection for
Exhibition.

Mixture of
ugly and
beautiful
objects.

I wish to note one other matter, that is, the want of some supervision or criticism on our exhibits *before they leave the country*. I speak of course of those of my own class, which are more or less decorative and artistic. I was struck myself by the fact, and the remark was often made to me by foreigners of all classes, that ugly things were exhibited side by side with really fine objects, without any apparent discernment on the part of the exhibitor of this incongruity. The same was said to me of other classes of objects, and I could never refute the charge.

If some means of weeding these exhibits could be found before they are transmitted for exhibition, I feel sure that our manufacturers of all kinds of objects would obtain greater credit when seen side by side with the French and other competing countries, who are rigorous, the former especially, in this respect.

The French makers achieved a great success. I consider, however, that some of our best houses showed even finer workmanship, not excepting the admirable mechanical perfection of Grohé. But the French gain great advantages from the spirited inventiveness and life of their designs.

A glance would show us their superiority in drawing and their constant representation of the figure. Their designers and workmen obtain a wider and freer instruction in academical drawing. This point cannot be too often insisted on. In Messrs. Jackson and Graham's fine pieces, no drawing of the figure occurred amongst the masterly arabesques of their panels; and, taking our other exhibitors together, figure-designs were not the most successful amongst their decorative ornaments.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Figure
design.

No great decorative designers can be trained without familiarity with the drawing of the human figure, and decorative work is sure to become tame and insipid, however graceful, unless figure-design in some way gives interest to points or portions of the work.

Its import-
ance.

It also seems to me an immense advantage (our first houses are well aware of this, and do their best to secure it,) that the foreman or designer should be familiar, or should at least pass some training in decoration *in all materials and methods*. He will settle to one method, sculpture, modelling, engraving, painting, or the like, but his *general knowledge* of the conditions under which designers work in different materials will be of infinite service in giving him confidence and freedom in the line he chooses himself, and in designing for mixed and varied decoration.

I heard it remarked by very intelligent French makers that our furniture producers were much advanced since 1862. I think this was no more than bare justice to them.

But I see no limit on account of nationality to far superior attainments, and I hope no method of training will be neglected, either by sending students to, or obtaining from great houses, or imperial or royal establishments, qualified teachers, if this be feasible, to advance our masters of design schools. It would be a great help to our artizans to be able to study our museums on Sunday afternoons and evenings (often their only opportunity).

Suggestions
as to Art
instruction
for artizans.

It would also much promote the use of the Art collections were simple, popular lectures to be given on public evenings, illustrated by a walk round the specimens under discussion, after the lecture. There is no lack of natural aptitude in the country. More general sound training is all that our designers or artizans require, and the experience of the last 12 years amply proves it.

The exhibition of furniture of all kinds included under Class 14 was one of the fullest and best represented in the building. All kinds of objects were to be seen, including a

MR. POLLEN
ON
FANCY FUR-
NITURE.

Union of
Classes
14, 15

number of pieces of church furniture of various kinds, such as pulpits, reading desks, screens, and presses for the dresses and vessels used at the altar. For jury purposes classes 14 and 15 were fused into one. They will be found under one set of numerals in the French Official Catalogue, from which, as far as could be, the numbers are drawn for the following report.

The visitor should consider both these classes of production together, as did the juries. Wall decorations, including fireplaces, marble altars, statuettes, church decorative objects, theatrical properties, hangings for beds, curtains, lustres, chandeliers, and the like, are included in the class of decorations. But so many of these objects are, practically, pieces of furniture, and must be made to accord with the furniture, or the furniture with them, if any agreeable unity of character is to be preserved in our buildings and rooms, that it is difficult to treat them independently. And, though in the present report movable objects alone are included, they should be associated by the critic with their decorative adjuncts; many will partake of the features of either class. The two together comprehend over 1,200 exhibits.

The exhibition of the French portion is naturally the largest and most important. It includes sumptuous pieces of cabinet work, decorated with costly sculpture and inlay; and some of the stalls contain specimens of every article, in different styles, to which we shall have to call the attention of the reader, and combining a thorough practical knowledge of the art cultivated by the cabinet maker in various and distinct periods that have left their special character behind them for three centuries.

The actual decisions of the jury will be seen in the list of awards. The rules by which jurors are guided direct that facility, reasonableness of cost, and improved methods of production should weigh in the formation of their judgment, as well as the beauty or richness of the actual objects.

Principles
of judgment.

Here it will be as well to point out certain principles which lie at the root of all criticism, that the visitor may not be dazzled by the number, nor warped in his judgment by the novelty of pieces of furniture to which he is unused. And, first, the general design of each piece of furniture should have some relation with the architecture of the room for which it is designed. The French feeling for unity between the house and its contents cannot be too highly commended. The pavilion of the Empress, in the

park, is a specimen of a room in which this is studied down to the minutest ornament. If the rule is occasionally carried out into dullness of effect, the too frequent forgetfulness of it is a far worse fault. In the present Exhibition the discordant union of different kinds of ornament in the same work, the perfect realization of natural foliage beside the most rigid conventional ornaments, has more than once turned the balance of a decision between two or more exhibitors so good as to be all but equal.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Next, it is a great merit in furniture designs that they should be such as are suitable to *furniture*, rather than absolute imitations of architecture, breaking up the whole into angles, mitres, and mouldings on too small a scale to give effect corresponding to the intricacy and laboriousness of the design.

Again, the discreet use of the materials, the convenience and adaptation of the various contrivances carried out in the cabinet, sideboard, chair, or other piece under consideration, should be well discussed; the goodness of the cabinet maker's work and the accuracy and skill displayed in the various methods of decoration employed should be noted, no less than the charm of the artistic sculpture, inlaying, engraving, or other method of ornamentation that give the final perfection to the work.

National usages affect both the kind and the form of much of the furniture used in different countries. In the Exhibition this will not be intruded on the visitor's attention. It is to be regretted that these national differences are not more apparent. A common standard is the general aim, and much is inevitably lost in consequence. It is hardly to be supposed that the cabinets, sideboards, tables, chairs, &c., in common use in England and France, should be in every respect as suitable to climates and national habits widely divergent from our own. Occasionally the grass chairs of Chiavari, the movable furniture from Austria—not mere camp equipage, but gay and ornamental objects made to pack on a fourgon—or other special objects, remind us that we see in the Exhibition rather too few national and ordinary pieces of good furniture and too much that is made specially as exhibition work.

National
furniture.

In the distribution of prizes, it is to be remembered that many of the silver medallists are so good as to be separated from the superior rank only by slender circumstances of inferiority; and, again, many of the bronze-medallists come close on the order of silver. The greatest pains have been taken, and the utmost praise is due to the spirited firms

MR. POLLEN
ON
FANCY FUR-
NITURE.

General
want of
novelty in
this class of
objects.

or makers who have done so much, and by such sustained exertions, to win themselves a well deserved place.

Of the general state of advance accomplished in the class of furniture, as here represented, since the London Exhibition of 1862, visitors will perhaps form diverging judgments. Still more is this likely to be the case, according to their different nationalities, in judging of the relative progress made by the various exhibiting countries. Whether, indeed, the Exhibition itself be a very satisfactory test of such progress is also open to a question. Still, we can but judge, in any case, by the materials here exposed to view, and one or two considerations should be borne in mind in reviewing them. First, there does not appear to be much that is new or original amongst the continental exhibits of furniture. The French, who are the most numerous exhibitors, give us an important novelty in the inlaid cabinet, hereafter described, by Fourdinois. Some heavy work by Diehl, containing metal bas-reliefs by Fremiet, is an invention, though, probably, the visitor will not care to see such work repeated.

Exceptions.

Improve-
ment in
English
taste.

A more valuable contribution is a cabinet admirably carved in relief, in stone and wood, by Depont, a self-taught artist; but the mixture of the materials is unsatisfactory. Mr. Cole, C.B., sends radiating double frames to hold and exhibit drawings, textile matter, and seals, &c., where space is of value, that have achieved a great and deserved popularity. His bookcases, on the same principle, are open to doubt, owing to their excessive weight. The old English revival in the satin-wood cabinet of Wright and Mansfield, and the various specimens of mediæval work adapted to furniture for our Gothic or Elizabethan houses in England, are all real efforts of invention, and should be carefully studied. The English exhibitors in this class, though few, are well represented. Much that was violent or extravagant in objects contributed by provincial makers in 1862 has disappeared, and the quietness and restraint in outline and detail so well exemplified in the work of Messrs. Jackson and Graham, have both influenced our own and reacted on the French houses.

Austria.

Austria exhibits one remarkable piece by Leimer—a Gothic priedieu and shrine, with inlaid and engraved doors, second to nothing of its kind in the Exhibition. Otherwise, the furniture in that section shows no real advance.

Italy.

Italy shows even less. The glasswork of Salviati does not belong to this class. The work of Barbetti is inferior to those sent in 1851 and the last two Exhibitions. Giusti,

while greatly enlarging the production of his carvings, has hardly advanced their excellence. The same may be said of the great pulpit of Goyers, in the Belgian section. (Woodcut published in the Illustrated London News of 1867, p. 385.)

MR. POLLEN
ON
FANCY FUR-
NITURE.

Cuypers, in the Dutch section, exhibits admirable church furniture; but generally the Dutch furniture is unimportant.

Holland.

The Prussian section shows good workmanship from Dresden. Ebony cabinets, heavy in design, but well contrived and carefully put together, rank with the second order of similar work in the French and English sections.

Prussia.

Portugal sends simple but solid work; Spain a few specimens of marqueterie to represent the quaint producers of this kind of work in the seventeenth and eighteenth centuries.

Portugal
and Spain.

On the whole, the palm for progress will probably be accorded to the English exhibitors, if the great variety of direction be taken into account, of their efforts to meet the wants of our town and country houses, churches, &c., so numerous and so various in style, size, and detail of every kind.

Our English variety of personal taste and requirement will be found, indeed, pushed to excess in the Exhibition, and to greater excess in many other classes of ornaments than in the objects composing Class 14. The want of unity of aim, and the absence of severer canons of judgment, spoil some of our very finest exhibits by admitting ugly and ill-designed objects merely for the sake of their novelty.

Want of
definite aim
in English
work.

We are not alone in this abuse, as visitors will easily see for themselves. But a people so active and energetic as ourselves are apt to be more venturous in the search for what is new than sound judgment can approve.

The order adopted in the following arrangement is as follows:—First come the leading medallists of the class; then the exhibiting countries in their several sections, as they occur in passing through the building, beginning with the French, which fills nearly half the entire space; then England and her colonies, and so on, in topographical order.

Order of
arrange-
ment in the
Report.

The most important objects in each country are cabinets, book-cases, sideboards, wardrobes, and other large fixed pieces of furniture. On those which stand up to the level of the eye, and are not moved, like tables and chairs, the greatest cost and skill have been lavished. Besides the

MR. POLLEN
ON
FANCY FUR-
NITURE.

adjustment of joints and fittings, the doors and members of these structures are ornamented with carvings, delicate reliefs, inlay of hard stone, and ivory, the latter covered with excellent engravings.

Beds in wood and iron figure, the former mostly in the French, the latter in the English, and all the other sections.

The satin-wood bedstead of Messrs. Heal, the admirable hanging of that exhibited by Roudillon in the French, and the iron bedstead by Kitschel, in the Austrian section, should be noticed as excellent specimens of each kind.

Tables and chairs, sofas, &c., of all kinds are less numerous in proportion, but form specially interesting objects to the visitor, as representing objects needed by and accessible to purchasers of all ranks.

Pianoforte
cases and
ornamental
billiard-
tables.

Pianoforte cases, billiard-tables, &c., are also exhibited as specimens of costly furniture. Less stress is laid upon them in the report, not because of any want of appreciation of their appearance, but because the ornamental aspect of all such articles is not the most important, and in some cases the ornamental design seems to interfere with the comfort of the player or the utility of the instrument. Very fine pianoforte cases are exhibited by Messrs. Jackson and Graham and Gillow; and a specimen of ornamental billiard-tables may be seen in the ebony frame of Blanchet, in the French section.

1st class
exhibitors.

Our first exhibitors are Messrs. Fourdinois (Fr.), Jackson and Graham, Wright and Mansfield (E.), Roudillon, Grohé, Lemoine, Gueret frères (Fr.), Thonet (Austrian). To these should be added Gatti, whose admirable inlay cabinets and table of ebony, pearl, pietra, and engraved ivory are unsurpassed as pieces of decorative work of their kind. The South Kensington Museum and the Imperial establishments of Peterhof and Ekaterinbourg, as Government bodies, and Messrs. Jackson and Graham, Grohé, Crace, and Knussman (Mayence, in Hesse), as jurors, are withdrawn from competition.

The numbers against the Exhibition names are quoted from the French Official Catalogue.

Messrs. Fourdinois's exhibition (2), France, has been considered so exceptionally good—not perhaps in every possible respect, as both Jackson and Graham and Grohé must be allowed to be in advance as to workmanship; but for design, originality, and progress, the two cabinets of M. Fourdinois, with all the advantages which such objects confer on this class of manufacture, decided the proposal in his favour of the grand prix, a certain specified sum having

been set apart by the Imperial Commission for the purpose of rewarding the merits of such inventions, or such perfecting of existing inventions, as had materially improved either the quality of the objects made or the processes of their manufacture.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Of all the objects produced, the cabinet, in inlay, of Messrs. Fourdinois alone, in the opinions of the jury, came up to this point. Their walnut cabinet (Woodcut published in the Illustrated News of 1867, p. 73), inlaid with engraved ivory, plates of lapis and bloodstone and covered with delicate carving in relief, seems the most perfect of their productions. But the ebony cabinet or dresser, inlaid with box, walnut, and other woods, is a step in advance not shown by any other exhibitor in the class. The peculiarities of this piece of furniture are the mixture of woods and the process of inlaying—the woods being woven together in the solid. It consists of a cabinet above with a dresser below, the cabinet standing on carved columns four in number, and are coupled by small arches, with a wider centre, in the manner of many such pieces in the sixteenth and seventeenth centuries. Over the arch mouldings are four figures, occupying the four small spandrils formed by the side arches. These are of boxwood, and stand out in clear relief from the ebony background; but they are let in so far as to be completely incorporated with the solid wood of the structure. The outlines of the limbs have to be maintained right into the ebony, having no spare boxwood for finishing the figure sculpture. It will be seen, on examination, that, of the light inlaid wood, no portions whatever exceed the exact outline of the sculpture; and what applies to these more important figures may be observed of the delicate work that stands in relief on the little columns below, on the brackets and various composing members of the structure. The base on which the whole stands is inlaid in relief in a similar manner. This has been acquired for South Kensington Museum.

Fourdinois' two cabinets.

Another important object is his carved walnut cabinet. It is the most delicately-finished piece of its kind in the building. The door panels, and flat spaces contain bas-reliefs of figure-subjects, sculptured and finished very beautifully. The drawers within the two side portions, or divisions, are inlaid with arabesques, finely designed and engraved all over. The mouldings, columns, &c., are relieved by delicate carvings, raised or sunk, but always with great feeling for the effective maintenance of the proportion and arrangement of the whole. Thus the larger mouldings

MR. POLLEN
ON
FANCY FUR-
NITURE.

are not left bare, but covered with work, yet so flat and delicate as in no sort of way to interfere with the general breadth of effect which the preservation of the proper curves and outlines of the mouldings ensures. There are, unfortunately, but too many instances in the present Exhibition in which this original object in composing elaborate pieces of furniture has been lost sight of in the ornamental additions. In other words, the unity of the original design is not sufficiently borne in mind by the artist or draughtsman, and, for the sake of good detail decorations, he allows the effect of his composition to be broken up. The winged animals below are wanting in apparent strength to support the solid structure above; the ornaments on their chests are not entirely in harmony with the absolute nature of the bones and muscles, feathers and claws, of the grotesques. These, also, have too much of the character of greyhounds, made for swiftness of motion; and the intense development of muscular excitement about their legs suggests the notion rather of creatures impatient for a course than the calm repose that befits a steady and sufficient support of a considerable superincumbent mass. The two objects together are nevertheless, monuments of the cabinetmaker's art, and unite the skill of the artist and the workman better than any other exhibit that can be pointed out, though many others are to be seen, and shall presently be noticed, of the finest design, and, as to workmanship, even superior to the pieces in question.

Jackson and
Graham.

Messrs. Jackson and Graham's exhibit (21) contains a cabinet of ebony inlaid with ivory and lapis, and with the ivory elaborately engraved (designed by Owen Jones). (Woodcut published in the Art Journal Catalogue of the Exhibition, p. 7.) This cabinet is also made in the same manner as to the detail of ornament as the ebony cabinet above described. The ivory is not veneered, but let bodily into the ebony and then carved. A careful examination of this cabinet, as of an ebony and ivory case for holding china, will show the excellence of Messrs. Jackson and Graham's workmanship. They are unquestionably, as regards workmanship, ahead of those of Fourdinois; but the objects do not embrace so many elements of artistic design, nor can the engraving of the ivory be placed on the level of the sculpture of the walnut or boxwood; but the work is vigorous, careful, and elaborate. The cabinet contains inlay of lapis which is not found in the other ebony and ivory furniture in this exhibit. The book-case, table, and

especially a chair, in this collection, are perfect specimens of work of the kind. The salient members are few and are restrained, so that the surface of the whole corresponds with the actual construction, and has no portions superadded by way of extraneous ornament, that spoil so much good work in the Italian, German, and Swiss sections. The engraving of arabesque work is elaborate and vigorously drawn. The lines are firmly indented, so as to show sufficiently at the distance required; and the portions of colour introduced in *pietra-dura* are of a sober hue, and harmonize well with the general tone of the piece. Messrs. Jackson and Graham exhibit, besides these pieces, tables and other furniture in *marqueterie* of light colours. These are put together and finished with the same exactness as the more important pieces already noticed.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Next in order we may class the cabinets of Roudillon (43), France. A small, black, ebony and ivory cabinet, with jasper columns in front, mounted in metal, is a very choice specimen of this kind of manufacture. The engraving of the ivory is more delicate and higher in style and aim than that of any exhibitor in the building. Nothing can be more delicate. The metal mountings of the columns are scarcely equal to the general merit of the piece. With it should be specified a black cabinet with glass doors, framed in bright decorated iron. It is very light, and the iron framework is in every way appropriate to its place. It is thinner and lighter in appearance than a wooden framework, and holds the glass more completely. It is to some extent a novelty, and should be brought under the notice of visitors. We must also notice a sofa, the framework of which is of quiet design, carved and gilt, and the covering fawn-coloured satin. The extreme quietness and good keeping of this piece of furniture make it a valuable example for us to follow. Our modern sofas are but too frequently failures in these several respects.

Roudillon.

Messrs. Wright and Mansfield (40), stand alone in the whole exhibition in the particular style of their cabinet. It is eminently a revival of English cabinet-work and English art in inlaying. Nothing is to be seen at all like it among the productions of any country here represented.

Wright and
Mansfield.

It has been the study of Messrs. W. and M. "to avoid the production or copy of any foreign period, and to illustrate English art in every respect." The work was characteristic of English furniture of the better kind during the third and last quarter of the eighteenth century, and of the designs of Messrs. Adams, who, with Wedgwood, did so

MR. POLLEN
ON
FANCY FURNITURE.

much to raise English art at a time when all Europe was suffering from exhaustion caused by the wars and calamities of the century. It has been specially designed and executed by English draughtsmen and artisans. The inlaying of the marqueterie, the excellence of the materials and of the work, both carving and framing, do full justice to the reputation of the makers. The piece deserves special notice for the gaiety and brilliancy of its tone. The most fashionable material, as we see it this year, seems to be ebony. Marqueterie, though exhibited in the French, Italian, Spanish, Portuguese, Austrian, American, and other sections, is generally of a deeper tone—red, brown, or gray; that of Messrs. W. and M., together with one exhibited by Mr. Crace, is on a ground of satin-wood, and rich and brilliant in consequence. It should be observed, too, that the work under consideration is mounted with carved and gilded enrichments in the old manner. The continental marqueterie generally is finished with cast and chased gilt mountings, which have more the character of extraneous additions than the carved woodwork.

Lemoine.

Lemoine (1), France, exhibited a black cabinet more architectural in design than the work of Jackson and Graham, whose ebony pieces stand far in advance of any in the whole building. The middle part is closed with doors of glass above and solid panels below. Plaques of enamel on blue ground form the centres of these panels, and are inserted in the wings, and in small circles in the angles of the door-frames. The middle part is finished with an interrupted segmental pediment, and the middle part of the base has the same. The columns that separate the centre from the wings end in caryatid figures. It will be observed that all these features impart an architectural character to the whole cabinet that makes portions of it heavy and ineffectively salient.

Guéret
frères.

Guéret frères exhibit a black cabinet of somewhat similar design and of quieter character. It is simple and light in design, and is not too architectural in general character. They show two carved life-sized figures in walnut wood, chandelier holders, which are well designed and carefully executed. These are pieces of furniture specially in place on stair landings, where similar objects were used in the Venetian, and other large Italian palaces to hold flambeaux.

Thonet.

Messrs. Thonet (35), Austria, have achieved a reputation for their chairs. From the position of simple workmen the Brothers Thonet have raised themselves to an important

position in the trade. They have agencies in London, Paris, and other capitals; and their simple, well-made, and economical furniture finds admirers and purchasers on all sides. The wood (beech) of which the chairs are composed is cut into long pieces, and bent by steaming into the forms here offered to the visitor. The method of construction is simple enough. The ordinary chair has one piece for the back and legs, one for the seat, one for a circular uniting bar, and two more for front legs. The various pieces are screwed together with pins and nuts; and, as these can be tightened up at any time, they are very serviceable. The caning is well made, and the cost of the whole—in London especially—very moderate. Much more elaborate twisting of their woodwork is exhibited in their stall, but the principle of construction remains the same.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Beurdeley (74), France, exhibits furniture of a costly kind, cabinets, tables, vases; clocks and other objects in buhl, marqueterie, and other methods of decoration. They are mounted with metal castings, chased and finished. Some of these are very elaborate. Most of them are from old moulds, and all are not exactly in harmony with each other in the larger pieces. His finest objects of this kind are his vases and some of his Louis XIV. reproductions. These last, however, though well chosen, do not confer the merit of individual invention on the exhibitor.

Beurdeley.

With the mention of these various exhibitors we should unite the Russian cabinets exhibited by the Imperial factories. As pieces of furniture they are, perhaps, hardly to be ranked with those of the exhibitors just named, their great merit being the splendour of the pietra-dura inlaid-work on the panels and other surfaces. As this work belongs rather to Class 15 than to that of furniture, we need not enlarge further on these two objects. The Russian and South Kensington establishments, as well as the Imperial factories of France, though awarded a place in the highest rank, are withdrawn from competition for the actual medal.

Russian
Imperial
factories.

M. Grohé (84) is withdrawn from competition as a member of one of the juries; but his exhibit is of the greatest importance. His reputation as a producer of work that cannot be surpassed stands in the foremost rank. If the fittings of his cabinets, drawers, slabs, sliding panels, tops that turn and roll in every conceivable direction, are examined, they will be found unrivalled for excellence of fitting, joints, material, and accuracy of line and cutting in every direction. His finest piece, though not the most

Grohé.

MR. POLLEN
ON
FANCY FUR-
NITURE.

showy, amongst the variety of his furniture this year, is the large bookcase, bureau, &c., occupying the centre of his stall. The form is simple, but well conceived, and all the execution admirable. It is full of drawers and contrivances of every kind, and angles and surfaces the most difficult to treat are perfectly worked out. His marqueterie is also as finely executed, though the designs are not remarkable. The visitor should not fail to examine the excellent casting and chasing of the metal mountings to his smaller pieces of marqueterie. His small tables are equally models of cabinetmaking.

Crace.

Messrs. Crace (10), in the English section, and Knussman, of Mayence, in that of Hesse, are also withdrawn from competition as jurors. Their work, however, is too good not to rank in the highest place. Mr. Crace exhibits a walnut cabinet, with pillars at the angles and scrollwork at the top. The work is decorated with excellent arabesque bas-reliefs, and the two doors are further set off by agreeable inlaid lines of ivory, with inlaid plates of pietra-dura at intervals. The panels contain figures in their centres, in bas-relief. These are scarcely equal in design to the general freedom and accuracy of the arabesque decorations. There is a small inlaid cabinet in satin-wood, with ivory pilasters at the corners, inlaid with arabesque-work, in the same bright and delicate tone as that already noticed of Messrs. Wright and Mansfield. Both pieces have a certain measure of progress about them, to be seen only in a few of the year's exhibits.

Gothic
furniture.

We have besides these a third piece of furniture, sideboard or buffet, Gothic, in oak, with projecting hood, and brass-work to the door-panels. Though small and simple, there is no piece of Gothic furniture altogether so successful in the British section. The other nations do not compete in works of this kind.

Knussman.

M. Knussman (2) exhibits a complete set of furniture, parquets in oak, chairs, a table, &c. The designs are simple; but the solidity, lightness, and excellence of the workmanship leave nothing to be desired. Nothing in the North German States, the Swiss section, or the Austrian surpasses the work here exhibited, in its own kinds.

Gatti.

M. Gatti (7), in the section of the Pontifical States, deserves a place amongst the first exhibitors. Two pieces of his marqueterie, which stand quite alone in their peculiar kind and unrivalled harmony of tone and of disposition of parts and colours, maintain the reputation he has won at former exhibitions. The pearl bands and the balanced masses of

engraved ivory are what distinguish this exquisite work from most that we see in other sections. There is nothing equal to it in that of Italy. The designs are plain, modest, and convenient.

MR. POLLEN
ON
FANCY FUR-
NITURE.

The pavilion shaped cabinet by Alessandri is in ebony inlaid with ivory carvings, and surmounted by a winged figure in ivory. The proportion of ivory to ebony is, perhaps, too great, and the space left for curiosities or precious objects too little.

Alessandri.

After this enumeration of the chief medallists, and those withdrawn by special enactments from public competition, we return to the geographical order maintained in the building, and begin the regular circuit with the section occupied by the French furniture-makers.

Jeanselme (6) exhibits a black and glass cabinet of polished wood, and the portions carved or incised are thereby brought into more salient relief. It takes away from the gravity of ebony and black wood furniture, but it wholly destroys the rich appearance of the material, and in the case before us goes far to impair the merits of this collection. The other furniture of Jeanselme is such as would not be appreciated in England, from its extreme gloom of tone. It is wanting in white inlaid lines, or in some more lively decoration than it possesses. The work is very carefully executed.

French
section
generally.

The most important and unique of the objects exhibited by Chaix (35), is his case for showing off jewels or other precious objects. It was shifted from its position in the French quarter, and placed in the centre of the grand corridor. The piece is an oval frame, with glass doors and panels divided by statuettes and studs, decorated with reliefs of various kinds in ebony, relieved by occasional touches of gilding. The whole is raised on a panelled base, decorated in a similar way. We call attention to this piece as being by itself, with one or two exceptions. This and the magnificent frame decorated with carved ivory in the great corridor by Alessandri are the only pieces that offer a solution to a problem, sometimes of great difficulty in furnishing large rooms, how to display precious things of various kinds so that they can be seen from all sides, and without choking up the general space. Jackson and Graham, and Roudillon, both exhibit cases for china or other valuables, but both cases are intended for walls.

Marcellin (No. 63) may be taken as the best exhibitor of parquetry-work. A table, opening to form a draught and backgammon-board, is his principal piece. Floors and work

Specimens
of parquet
work.

MR. POLLEN
ON
FANCY FURNITURE.

of this kind in all forms are shown in specimen pieces by this exhibitor. As this class of work is comparatively rare amongst the productions of English cabinetmakers or joiners, and very common on the continent, it will be of importance to call the observer's attention to some of the choicest specimens. In the Belgian, Hessian, Russian, Prussian, Swiss, and almost every section of the Exhibition, with the one exception of our own, floors made of oak, more or less mixed with inlays of darker wood, will be seen exhibited. We do not use these floors so much in England, the universal custom being to carpet the entire room up to the skirting. It is, however, becoming a fashion in modern houses to lay down borders or whole floors in the reception-rooms of oak, grooved and tongued together in the ways here shown. In 1862 some specimens of work by actual English manufacturers were exhibited; unfortunately there are none this year. These floors will be more fully described in the report of class 15. They belong, however, so completely to the furniture of rooms that it is necessary to call attention to them here. The oval floor, of which a model only is exhibited in Marcellin's stall, was made for the Crown of Portugal. The two axes of the circle being unequal, every one of the radii of which the centre is composed differs in measurement and form, and the perfect adjustment of so complicated an arrangement will give the visitor the best conception of Marcellin's workmanship. In connexion with Marcellin the visitor should see some bed-room furniture by Munz (34). This is made much in the same manner, and offers useful suggestions for panelled work. He has decorated the plainer surfaces also with small indented patterns, gilt. For quiet ornamentation of surfaces not meant to be broken up this is as good a method as can be used.

Gradé et Pelcot (52) have disposed of the plain surfaces of their principal object—a black ebony press, with inlay of wood and ivory arabesques, in the same manner. The work is in squares, the grain of the alternate pieces running at right angles to each other.

Sauvrezzy (46) exhibits an ebony cabinet, the panels and corners inlaid with pietra-dura and enamels; and Ledet (139), a maker of importance at Bordeaux, a very quiet, well-designed cabinet or press, closed above and below. The last is of excellent form, and could be made at a moderate cost. Gœkler (134), a black book-case closed with glass, the lower part forming a press. It is simple, and is his best object. His bed-room furniture is ornamented with black

cutwork applied on polished tuyau. This work will be found in several other exhibits, specially of bed-room furniture. A certain unsatisfactory want of solidity is a characteristic of such ornamentation, while it hardly relieves the heavy look of many of the objects to which it is applied.

Buhl.

Roux et Cie. (83) are the principal exhibitors of buhl. A large table in the Louis XIV. manner is the finest of these pieces. It is made with care, and the border mounting of metal that holds the whole slab together is ingeniously fitted on to its bed. Instead of screws showing outside, they are welded to the inside of the mount, passed through the wood below, and secured with nuts. They have also avoided the heavy angle-pieces formerly used, by welding the juncture and making the whole solid. The lion-skins give an unnecessary heaviness and bulk to the legs; but the work is very remarkable. A large central buhl cabinet is rich and well put together. Pecquereau (47) exhibits in buhl; but his book-case and other pieces in cabinet-work are his most important objects.

There are other cabinets of great merit in the Exhibition, which should be examined. Allard (82)—black, with panels of faïence, picturesque rather than decorative; a console table, carved, but not yet gilt, in pearwood—a fine specimen of the work; Sormani (49)—a very well designed small black cabinet; Richstaedt (68)—a large press, with shelves, closets, &c., and many others deserve notice. In a report like the present space does not admit of particular description of more than specimens of the various work.

bles.

Next we may notice—Tables, Chairs, and Bed-room Furniture. Ribal (220) has a good exhibit of dining-room tables. A walnut table on carved legs opens with a winch and screw-rod, the bed being made as in our ordinary English tables. The feet divide in an ingenious manner, so as to support the inserted leaves and retain their ornamental character when pulled asunder. Together they compose into a central mass that looks, perhaps, heavier than ordinary legs would; but the arrangement is judicious, with the view of separating them. Other tables, also expanding, should be noticed in this stall. The general exhibit in the French section of tables of a large kind is not important, and we will confine the notice to this exhibit. Billiard tables of an ornamental kind are to be seen in a small court, collected together. The best is in ebony, quiet and unobtrusive in design, by Blanchet (204). Ingenious mechanism is employed by Fouqueau (206) for expanding the cushions, so as to include pockets, if desir-

MR. POLLEN
ON
FANCY FUR-
NITURE.

able. As billiard tables, however, the present report cannot consider these exhibits. The reader may be here referred to Pellegrin (293, Class 15, French Catalogue) for a most ingenious mechanical table containing a variety of games of the bagatelle kind too complicated for description but well worth a visit. Chairs are more numerously represented. The best specimens may be seen at Sormanni's (49), Rebeyrotte's (125). These are very good, light, elegant, and inexpensive. Gallais (65) has excellent specimens of light, carved chairs, but they are dangerously liable to breakage. The Association des Menuisiers (170) have also good chairs. Other makers exhibit them, and all should be noted. Godillot cane-seats for summer-houses and many others. Boisville (75) exhibits branch chandeliers, fenders, and fire-dogs, fire-irons, and other objects for the fire-place, in brass and latten. The designs are mostly reproductions. They are exceedingly effective. Meyer and Raulin (56), lac furniture for drawing rooms in imitation of Chinese. The work is very careful and, as far as an imitation can go of work only interesting in Chinese hands, it is successful. The gilt mounts are well executed.

Bed-room
furniture.

The class of sumptuous or fancy furniture is mainly intended for reception rooms. We shall see, however, a large stock of costly bed-room furniture, and some specimens shall now be quoted. Mazaros, Ribailier, & Co. (64) make the most interesting exhibit of beds and wardrobes. The work is in oak, and carved in the French Renaissance manner. The bed is light, though solid, and cheerful; the wardrobe simple, sensibly conceived, and carefully worked. The French exhibitors wisely eschew French polish and the varnishing brush almost entirely. Their carved work is invariably left at a good surface, waxed, and nothing further. No one will fail to see how much better all the work appears without the flash and smear of polish and varnish. The softer woods, the satin-wood pieces, and most of the marqueterie is polished, with advantage, both by our own exhibitors (as in Messrs. Wright and Mansfield's, Jackson and Graham's, Crace's and other exhibits) and by the foreign exhibitors in these materials. But hard woods parquets, ivory, and other hard inlays, and all carved work, are left with a natural surface by the French. The visitor will agree with us in regretting that such a rule is not more general. Messrs. Mazaros & Co. should also be noted as the designers of the ornamentation of the great corridor.

Other French exhibitors of bed-room furniture are Mercier frères (85), and Gallais (65). The former exhibit

massive beds and wardrobes of polished wood, with cut-work applied. The designs of the beds are in both instances somewhat loaded, and the effect of the applied work here, as elsewhere, is unsubstantial and poor. Other specimens will be seen in this section. Gallais exhibits japanned work covered with floral ornament in white or very delicate tints. This work is more usual in panels and flat wall-decoration, and in positive cabinet work wants substantiality of appearance. It will be observed also that the decorative portions are peculiarly liable to breakage.

Bruzeaux & Co. (148), bed-room furniture in purple wood, polished. The effect of the colour is not agreeable. Other specimens of this wood will be seen, but the visitor will feel how much relief the employment of such toned material requires. Fournier (48), lacwork drawers and bed-room furniture, heavy in effect; and Heulley (126), stained maple bed-room drawers and wardrobe, with mouldings of purple-wood inlaid, rather gloomy in colour.

The most successful of the light coloured bed-room furniture will be seen in the English section, where simple means are employed, and with more effect. Only one or two instances of polished deal-work, not of importance sufficient for quotation, can be met with in the French section. Gilding, looking-glasses, hangings, and wall-decoration will be described in the report on Class 15. The visitor should not forget to go and visit the pavilions or kiosques of the Emperor: that of the Empress by Penon (by far the best); that of the shawl dealers, by Diéterle, jun. (very good), and the Turkish, all furnished with more or less cost, of which carpets, gilding, decorations in painting, and wall hangings form the principal objects. These will be referred to Class 15.

From the French section, which occupies half the entire circuit of the building devoted to furniture and house decoration, we now turn to the next most important contribution, that of Great Britain and the British colonies and dependencies. Three of our chief exhibitors have already been quoted; there remain, however, a number of admirable objects second only to the few choice specimens already described. The classification in the catalogue does not entirely follow that which is made in the report, "furniture" and "decorations" being found in the British portion of the catalogue occasionally interchanged. I shall, however, proceed in the order hitherto pursued.

The productions of Messrs. Jackson and Graham, Wright and Mansfield, and Crace have been already noticed. The

MR. POLLEN
ON
FANCY FUR-
NITURE.

Pavilions in
park.

Great
Britain.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Light
coloured
woods.

visitor will observe that many of the finest pieces both in the French and English section of the building are ebony or imitation ebony furniture. Excellent workmanship, carving, and construction characterise the more important objects in this material; but in the English section satin-wood, oak, and other light-coloured woods are largely employed. Great efforts to brighten up the fittings and decoration of our living rooms are made on every side, and the results are well seen in many objects now exhibited. Still, as bright colours are dangerous elements, unless very harmoniously combined and limited in application, partial failures must be expected and will be noticed; but the effort is in so good a direction that, with guidance and careful choice of designers, we may look forward to great successes in these manufactures.

Messrs. Trollope (34) exhibit various important and interesting objects. (Woodcut of ebony cabinet published in the Art Journal Catalogue of the Exhibition, p. 36.) The large cabinet in marqueterie and metal mountings, slightly changed, has been already exhibited in London. Their central table is of inlaid woods. The tone of colour is agreeable, and the work is finished to the highest degree of perfection. A large sideboard, with arched recess or dresser at the back, and supported by columns decorated with festoons, figures, and other sculptured ornaments. (Woodcut published in the Art Journal Catalogue of the Exhibition, p. 181.) An architectural character of decoration will be seen throughout the works of this exhibitor. In the smaller black cabinet the upper cornice is ornamented with Doric triglyphs and guttæ, and the sideboard, though less distinct, in this way, has many architectural features about it. The whole of the workmanship, however, and all the carved decorations are admirable. The foliage and other ornaments of the ebony cabinets (carved by Rogers) are unsurpassed for graceful, delicate representation of the vigour and movement of vegetable life by any sculptor in the Exhibition. The leafwork on the columns of the productions of Lemoine and Fourdinois is not superior to that of Rogers.

The French cabinet makers have wisely restricted the use of French polish to woods too soft, or to marqueterie too much mixed and too dependent on splendour of hue, to do well without it. This is the case with the ebony pieces of Messrs. Trollope. It would be well if the same rule had been observed in the sideboard. The flash of the polished surfaces detracts from the unity of hue and apparent unity

of mass in the whole. The polished surfaces detach themselves too distinctly from the carvings.

Messrs. Gillow (14) exhibit an excellent piece of workmanship—a black book-case. The pieces consist of a centre between wings, with arched niches, intended for statuettes of Milton and Shakespeare in oxydised metal, but now occupied by vases. The general effect of this work is superior to that of the two black cabinets last mentioned; but the design would, perhaps, have suited a larger object better, and its excellent detail is crowded together for want of space. Their sideboard in pollard oak, carved and inlaid, is carried out in detail with great care and cleanness of carving: portions of the piece are polished, the broad surfaces and the carved parts left with a fine surface. It is probably intended to relieve the massiveness of the design. It has, however, more than the first named, the disadvantage of seeming to indicate an actual separation, as if the carved work were applied or superadded. (Woodcut published in the Illustrated London News of 1867, p. 625.)

MR. POLLEN
ON
FANCY FUR-
NITURE.

French
polished
work.

A large wardrobe, decorated with carved medallions of natural foliage, and inlaid work of the severest geometric and conventional character.

The contrast between these two methods of decoration is too pointed, and the entire work loses some of its effectiveness in consequence. The carving and the inlay, as well as the general fitting of the whole piece, are equal to the finest of Messrs. Gillow's workmanship. Excellent inlaid tables and fancy pieces of various descriptions are included in this very full exhibit.

Messrs. Holland (18) do not exhibit any piece like their inlaid table of 1862. We notice, however, a large sideboard designed for a modern Gothic house. (Woodcut published in the Illustrated News of 1867, p. 72.) The upper portion is subdivided into pigeon-holes, shelves, and other ingenious contrivances for exhibiting or putting away pieces of plate, porcelain, &c. The backs of portions of it are inlaid with grotesque animals, arabesques, and other ornamental detail, and embroidered hangings, tastily chosen as to hue and ornament, are added to protect pigeon-holes or shelves from dust. The general design has been criticised as too solid and massive for a construction of wood, and too much in the character of a tomb. In many of the parts columns, buttress projections, and the like remind us too much of some ecclesiastical structure, and, in any case, might be reduced and lightened to advantage. It is to be remembered, how-

Gothic
sideboard.

MR. POLLEN
ON
FANCY FUR-
NITURE.

ever, that this is one of the earnest efforts, already alluded to, to supply the modern Gothic houses with furniture in some way suitable to the buildings they are intended for, and the whole piece is full of interest and invention. It is larger, and attempts far more, and is more original than the excellent buffet of Mr. Crace, already described.

A small press about 3 ft. high, in the Architectural Court, by Mr. Hayward' (16), in oak, is worth notice, and may be mentioned here. Small medallions, in oil painting, are let in at the sides, and the spandrils of the door frames are decorated with carved foliage, wiry and dry, but elegantly composed. It is a great difficulty to get furniture of this kind fairly appreciated at its real worth. Our national architecture and special usages give us a greater taste for pieces of this special style in England than is to be found amongst Continental nations. Mr. Holland is producing a considerable quantity of this kind of furniture. It is but justice to state here that, for domestic uses, there is no Continental work throughout the Exhibition comparable to our own in this style. As ordinary room furniture, such specimens as we see are absolutely unworthy of notice.

Messrs. Whytock, of Edinburgh (38), have a black ebonised bookcase French polished, and of which the decorations are pierced work applied or stuck on—a poor method; and its poverty is set off the more from the contrast between the unpolished additions and the shining surface below.

Wertheimer (37), an important piece of metal work. It is a console table, the supports of which are of polished metal, hammered with great freedom and skill. It is of importance as a new method of employing metal, and with considerable effect, in our modern furniture. Ward (35) has invalid chairs, admirably contrived.

The Gothic sideboard of Messrs. Heaton and Butler (15), in the Architectural Court, is worth examination. Like the press of Messrs. Hayward, in the same place, it is decorated with painting, in the form of panels representing the months. It wants lightness and more of the character both of woodwork and of furniture. Still more tomb-like is the bookcase of Messrs. Harland and Fisher, in the Architectural Court. A tall lectern eagle with figures, by Mr. Baker, is well executed.

Piano case (the musical portion belongs to another class), by Mr. Coleman (9), with a lady's secrétaire. A good deal of care has been bestowed on the designs of both; they

are a little laboured and heavy, but well made. Lamb (23), of Manchester, exhibits a sideboard, with carved figures (small lifesize) in walnut, on the back. This was in the Exhibition of 1862. The work bears evidence in the carving, of foreign design. The smaller cabinet, inlaid woodwork, with carved plaques of wedgwood ware and indented gilding, is English work and design. Greater concentration, or even the omission of some of the lines and spots of gold, would have kept the general tone in complete harmony. But the piece is lively and is well arranged.

MR. POLLEN
ON
FANCY FUR-
NITURE

Mr. Cole, C.B. (8), exhibits radiating frames for pictures, patterns, medals, &c., noticed in another part of the report. Messrs. Filmer (13), dining tables, expanding with rims; and a composition ottoman that takes into four pieces. The chairs of Messrs. Ingledew (20) deserve exceptional attention; one, of which the back is formed by flaps of the leather, stands alone in the Exhibition. Less novelty is shown in chairs than in most other furniture. Those of Messrs. Ingledew give us in a suitable modern form the old Spanish leather chair, light, durable, comfortable, and extremely simple in construction.

Chairs,
Ingledew.

Messrs. Bettridge (4), of Birmingham, the most important of our producers in this line, exhibit a full stall of lacquer furniture. If the designs of some of these pieces are unsatisfactory, the work is unrivalled. Meyer Raulin, in the French section, exhibits actual studied imitations of the Chinese, and with the greatest skill; but for light gay work of the kind, aiming at a sort of character of its own, none comes up to the work of Messrs. Bettridge. The Dutch, the Italians, indeed most sections, exhibit something of this manufacture; but both the Dutch and Italian exhibits are poor and feeble beside these.

Lacquer
furniture.

In bed-room furniture the British exhibitors are unsurpassed. The satin-wood set of Messrs. Heal (60) is solid and well designed, if we may make the one exception of the pointed vases or knobs above the wardrobe. But the French-polished deal and other soft wood furniture is particularly adapted to the use of bed-rooms. It has won unqualified admiration from our neighbours, and from its cheerful and cleanly exterior is suited to bed-rooms in any climate, gloomy or cheerful. The most successful exhibit, and the simplest, is that of Messrs. Dyer and Watts (12). They are largely employed in the trade, and their means are as simple as their work is excellent. The prices are moderate. The pieces exhibited this year—a wardrobe and toilet glass—are even more ornamental than is usual in

Bed-room
furniture,
Heal.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Iron beds.

their manufactures. The French exhibitors show nothing equal to these productions, still less any other exhibiting nation. Messrs. Hunter (29) show a large wardrobe in stained wood, more artistic in design, and with cameo panels of Wedgwood ware. The workmanship of the doors and shelves, &c. is well worth examination.

Iron bedsteads are exhibited by every one of the competing countries, or by the more important sections. In the British we may notice Winfield, most of whose work comes into other classes; and Peyton and Peyton, of Birmingham (27). Their best work are the plainest beds. All critics and juries seem agreed in regretting the tawdry and awkward stamped or cast pieces of decoration added to some of these articles. They add no strength, are too often so many hooks and spikes to catch bedclothes and dresses, or to scratch the skin, and are generally poor and vulgar in appearance. The good solid, light, and plain bedsteads, well put together, strong, neat, and moveable, are the most successful in the stall. We may also notice the useful spring mattresses of Verrichio here exhibited. Messrs. Spiers, of Oxford (32), contribute excellent washstands. These obtained a reputation in the 1862 Exhibition, but those now sent have certain improvements—conveniences at the sides to hold bottles, soap trays, smaller basins, and so forth. They are either painted white or made in white wood—clean, fresh, and agreeable.

We proceed to the British colonies, India, and the North American States.

India.

India is well represented in other classes. In the report of class 14, however, there are some objects to be noticed of great importance. The most imposing exhibit in this section is the cut and pierced furniture from Bombay and Madras. It represents a large industry, and one that absorbs much excellent talent in wood carving. But it is an instance of skill in the workman under unfortunate direction. In this respect it came under the notice of the jurors in 1862, and was the subject of much discussion. The manufacture is so important in both Presidencies, and such quantities of this kind of furniture are both used and exported, that many of the unsatisfactory qualities of the objects are overlooked. Messrs. Nowrojee and Shapoorjee and Co., and Messrs. Deschamps, are the principal exhibitors. The work is manufactured by native workmen. Other work has also been sent, made by British workmen, and is for the present to be seen in the room over the "press," in the outside of the British section, over one of

the refreshment rooms. The designs of the carving are more florid in these last pieces, and the work is so much farther removed from its native origin. It remains, however, a very nondescript and inconvenient class of furniture. The objections to the work in the form presented to us may be briefly put. The work itself is, in detail, Indian. The piercing and carving are skilful and laborious; but such work was never intended for European forms, and in consequence the effect of all this skill is lost. As for convenience, the visitor will judge how long a table or chair so fretted could be used without breakage, or how much the limbs of every one using it could preserve a whole skin. The tables have a carved border, liable to breakage and impossible to clean, and curving outwards so far as to render the actual use of the table itself scarcely possible. The chairs and sofas are also unapproachable in the crowded rooms of modern houses. Then, as we see it composed, the work is so over-pierced and fretted that the objects look unsubstantial and the ornament like cast iron. This unreal look is completed by coats of varnish, which cover the entire grain of the wood, and give glistening points of light in every direction to the carving.

A superb screen on carved ivory stem is presented by the Maharajah of Benares to the King of the Belgians. A chess-table and men of sandal-wood and carved ivory, in the old character, from Barhampoor; an inlaid and covered sandal-wood *secrétaire*, from Bombay; both these are excellent instances of the application of the native art to forms that bear it well, and will always be amongst the objects most prized in Europe. Another in sandal-wood, by Jamsetjee Heerjeebhoy, from Bombay. Excellent work of this kind is exhibited by Bowanishunker Huribulubh, of Bombay. A curious temple lamp from Mynapoorie should be examined. It stands as a piece of furniture, and is in brass, in branches. Each branch bears a peacock on a hinge. It is opened to receive the oil, which, when it shuts, distils through a hole into the pan of the lamp, and feeds the wick. The gilt lacquered chests from Bareilly, and the carved and gilt chests and statue pedestals from Rangoon, should be well examined. The work is in both cases highly decorative, though not difficult of execution, and retains the impress of real native use and production. Other work there is both from Bombay and Scinde, carved in vigorous low relief with geometrical inlay of ivory, metal, and wood, a characteristic chair in Scinde work painted and lacquered. Also Cashmere work of the latter kind of wholly Persian

MR. POLLEN character and richness of hue. But most of this work is
ON on small boxes and cases, and will be described more com-
FANCY FUR- pletely in the reports of another class.
NITURE.

The other British colonies are represented better in
The Cape. woods and the materials of furniture than in manufactured
objects themselves. We notice, however, in the Cape
section a cabinet and table well made and inlaid with
geometrical work in the various coloured native woods.
It is greatly to the credit of settlements so distant that
they should make and send work capable of taking so good
a position in the Exhibition.

Canada. Canada sends furniture for bedrooms well made in
polished ash of splendid grain. Nova Scotia exhibits a
few pieces of household furniture, chairs, &c.

Hawaii. The kingdom of Hawaii is represented by Holdsworth (1),
of London, who exhibits a table of native wood made at
Honolulu.

United States. The United States section contains tables, by Peter
Glass (6), from Wisconsin. These are in marqueterie of
coloured woods, full and brilliant in hue, and of very great
variety. Portraits of great national characters are let into
the inlay in wood engraving, and the whole is well put
together. We have also chairs by Bacon (4) and English
and Merrick (5). Their exhibit in the other portion of the
united classes is more important from the splendour of the
marbles in which they work.

Siam, &c. The kingdom of Siam is represented by tables of the
national make. Tunis, Morocco, and Algeria may be
classed together. Small tables for money-changing, desks
for reading the Koran, low stools, and painted tables form
the substance of their exhibition. In the Algerian section
we have a press, by Bontung (France), misplaced amongst
purely Oriental objects. A splendid old piece of geome-
trical inlay, one of the old cassone, made probably in Italy,
is exhibited in this section; but it is not to be taken as a
production of our own day, nor out of Damascus shall
we see anything analogous to this rich and delicate
manufacture.

China. Chinese furniture is not altogether unrepresented.
Chanton (1) shows a number of pieces of furniture in the
way of étagères, or shelves in iron wood. Other pieces are
also exhibited, less Chinese in character. The barbarous
decorations that are applied to designs of a European
character are less successful even than the Indian work of
Deschamps from Madras, and for pure Chinese furniture we
must look to some few of the objects exhibited by Tching-

Yong (4), a house half French, and which has attempted to engraft European notions on Chinese traditions. The workmen employed are, however, native Chinese, and the furniture has actually been made in the country and imported.

MR. POLLEN
ON
FANCY FUR-
NITURE.

There is nothing specially interesting of Class 14 in the Egyptian section. Egypt preserves, in greater perfection than Turkey or any other Eastern nation here represented, old Arab customs. The large pavilion in the park, a house in the best style of Cairene architecture, and of solid masonry, should be visited in order that the reader may get a true notion of the value still put upon the traditions of Arab refinement by the existing Egyptian government.

Egypt.

Turkey shows us excellent specimens of the geometric inlay of Damascus. Chests, reading desks, stools, and much small work of similar character. The pearl-shell and walnut-wood, in squares, triangles, and other simple forms, are full of delicacy and rich effect.

Turkey.

Roumania exhibits a modern Gothic bed, intended probably for the Exhibition, and not to be taken as a specimen of the ordinary furniture of the country.

Roumania.

The Pontifical States are not represented by numerous exhibitors in Class 14. Such work, however, as there is, must be considered as exceptionally good. The inlaid ebony, pearl, ivory, and pietra work of Gatti has already been described. Excellent carving in wood is exhibited by Raffaele Vespignani. Most of the objects of the combined classes are in marble, pietra dura, or mosaic, and will be referred, therefore, to the report of Class 15. The political storms and troubles of the day, which must be taken into consideration in judging of the neighbouring productions of the kingdom of Italy, have not affected the artistic supremacy of Rome, which seems to maintain its attraction for all kinds of refined and delicate workmanship, in which the accomplishments of the artist are united with the manufacture of objects in daily use.

Pontifical
States.

We now come to the section belonging to the kingdom of Italy. A vast number of provinces and cities are here represented that, in our earlier exhibitions, would have stood for so many separate states. From the southern cities and villages of Naples; from the portions of the Romagna formerly delegations of the Papal States; from Florence, formerly the centre of the grand duchy; from Lucca, from the great and wealthy cities of the Lombard and Venetian kingdom, and that of Sardinia and Savoy, we have an immense number and an endless variety of objects of every

Italy.

MR. POLLEN
ON
FANCY FUR-
NITURE.

description. Next to the French section, no one, not even our own, which occupies so large a portion of the foreign division of the building, sends so full a contribution of furniture and decorative objects for rooms. They will be found crowded together in two large courts and overflowing into the corridor from which these open. The space is wholly insufficient for the proper exhibition of so many showy and expensive objects. The visitor will have to squeeze his way amongst cabinets, tables, bedsteads, chairs, billiard-tables, vases, cases of carved frames, and panels in bas-relief, many of the latter excellent specimens of delicate wood carving. Many elaborate tables are difficult to examine, and the visitor must have patience if he wishes to pass a dispassionate judgment on the articles themselves.

Royal
factories.

The first thing that will strike him is the poor part played in the Exhibition by the Royal factories of pietra-dura work of Florence. Two admirable table-tops of the older workers, not sent for competition, will give the visitor a notion of the exquisite skill and feeling for decorative effect of these factories in their more palmy days. In this report we are concerned only in the cabinets and pieces of actual furniture in pietra dura. As specimens of sumptuous material and judicious arrangement of colour, these objects bear no sort of comparison with those already noticed from the Imperial factories of St. Petersburg. The visitor should examine them, however. Instead of the severe treatment of natural forms necessary to give effect to curves of leafage, birds, or the like, each line or form well distinguished, and treated as an agreeable method of breaking the colour and relieving the dark groundwork, we see attempts to represent actual nature with spurious shading, and leaves, birds, pearls, and other objects treated with pictorial roundness and relief. One form or leaf is found over another, and branches or bouquets of leaves, &c. The result is an appearance of crowding in one part and poverty in another part of the field or slab of marble. Then such relief is not really possible in the materials used, and their proper effectiveness of contrasted colour, quiet classical forms, and curves severe but delicately varied, is lost sight of. Nor do we see the rich incrustations of fruits and flowers so splendidly carried out in the Russian cabinets, in which agate, jasper, turquoise, amethyst, and precious crystals of all sorts are admirably cut and worked out by the decorator.

We shall pass over any further notice of this work and proceed to the furniture in the Corridor and Furniture

Court. The finest piece is the ebony and ivory cabinet of Annoni and Brambilla (19), in the corner. It is large and dignified in general outline. The sculptured portion is not equal to the finer French and English work, but, on the whole, well balanced and proportioned. A certain florid abundance in the inlaid ivory, that would be out of place in a smaller object, comes in with effect in this piece, which is grandiose in scale, and fitted for the stately rooms of the Italian palaces. Giusti (2) stands well in this exhibition. A number of carved pieces, friezes, and frames, but including besides furniture of several kinds, should be carefully examined. Nothing in the whole Exhibition is more delicate, firm, or well chosen than his arabesque ornamentation. He has the merit also of having produced many admirable scholars. Frullini (97), besides portrait bas-reliefs, exhibits carved furniture or pieces of furniture, in soft woods, full of grace and delicacy. Franceschi (66) in the same manner. Ferri exhibits a sideboard and small chests carved in the manner of Giusti, admirable in design; Gaijani (65) carved works in white wood. A cabinet by Cairoli (6) may be examined as one of the best in the Italian Court. It is small, but quiet and judicious in design, tone, and execution; it is in teak or similar wood, with ivory and ebony inlay. It stands in pleasing contrast with more ambitious objects of similar kind. Scotti, of Milan (88), exhibits a black cabinet, with indifferent ivory engraving. Picchi (12), Mengozzi (37), and several others in the corridor exhibit cabinets in carved walnut, ebony and ivory, and pietra-dura work. They do not come up to the works already named. Levera (4) has a good, convenient buffet or sideboard in walnut, carved. This is the ante-room of the court; Niccolini (79) a small ebony cabinet, inlaid with ivory.

In marqueterie, Polli (13), of Florence, exhibits the most important object. It is a table standing on a solid base, heavy and ungainly in form. The inlay is bright in colour, and contains allegorical figures, not remarkable. The mountings partake of the general heaviness. Pasquale Corridi (32) exhibits light coloured marqueterie tables, something in the tone of our English seventeenth-century work of this kind, but without its harmony and modesty. Mengozzi (37) descends lower in style and execution. Sorrento work is exhibited to greater advantage. This wood mosaic is lively and characteristic. It is best adapted for small objects; and an ingenious and complicated piece of furniture of this description, containing unexpected

MR. POLLEN
ON
FANCY FUR-
NITURE.

fittings of all kinds, will please and amuse the visitor. Salvatore Coco (18) has a walnut-wood table, with uncomfortable legs neatly carved. The large billiard table in marqueterie, by Laraschi, is worth notice. Barbetti (13) has a beautiful carved walnut priedieu in the corridor, admirable in style and execution, though unequal to his sedia in the Exhibition of 1862. The chairs of Chiavari, particularly those without carved backs—a graceless and uncomfortable innovation—continue their well-deserved popularity; they are light, comfortable, well put together, and economical in price. The geometric marqueterie table tops of the Institute Mannin in Venice, and the piano-case of Marchisio, should not be overlooked.

We must not leave this sumptuous furniture without calling special attention to a large toilette glass by Giuseppe Bonaiti (no number in catalogue). It is at the end of the Furniture Court, near the corner occupied by the great ebony and ivory cabinet of Annoni Brambilla. This glass is framed in dark wood, teak probably, and inlaid in delicate forms with pearl and metal. Nothing equal to the judiciousness of this pearl work can be seen in the Italian or any other section, except in the inlaid boxes of the Cochin-Chinese. For colour it is equal to Gatti's work, but it seems to combine the exact quantity and disposition of such ornament as applied to costly bedroom furniture.

The bedroom furniture in this court is not altogether a success. The most important exhibit is the bedstead of Ranelli (35). The form will at once strike us as uncomfortable. Gables and sharp points offer themselves at every corner of the bed. The colour and decorations are unsatisfactory. The metal bedsteads are good, but deserve no special mention. They would be better without knobs of glass.

Russia.

Russia is mainly represented as to Class 14 by the Imperial manufactories already described. Petit (4) exhibits several pieces of ordinary drawing-room furniture; the best a toilet table, with looking-glass between small blocks of drawers, with marqueterie top and sides, a secrétaire, and other pieces. Shantzenbach (5) a lady's secrétaire. In the court will be observed the exhibit of the Caucasian embroidered sofa, &c. Two chairs, heavy, but of characteristic form and simple detail, should be observed.

Sweden.

In Sweden we may note the bed of Edburgh (1), the walnut cabinets of Aman (9) and Shroeder (10), and the general exhibit of Lastbom (2). We do not, however, obtain any notions as to national style or peculiarities in

the Swedish as in the Danish section. The interesting figure exhibits of the Scandinavian sections belong to another class.

Denmark.

Denmark has an interesting exhibition. A society for the encouragement of art workmen exhibits several well-designed and neatly-made objects. A cabinet in marqueterie, of good tone and design, is the chief object. There are also good tables by Jensen Brothers (4), marqueterie in excellent tone and well executed, with bookcase, bureau, and chairs. With these should be noticed the furniture made for the palace of Fredericksburg, also by the society just named. It is quaint in style, after the manner of our Jacobean Renaissance, and its design must be accepted as necessary for the due keeping of the rooms it is to furnish.

Norway.

Norway does not exhibit much, nor can much be said for the Gothic furniture intended for the Royal palace at Christiania. There are good wickerwork chairs by Christian, sen., with seats embroidered with beads.

Greece.

Greece has nothing, at the date of this report, of importance. We see a small court fitted like ordinary drawing-rooms, with stuffed chairs and sofas. There is a table with ornamental mountings of white metal, which may be taken as the most conspicuous object exhibited. Hangings, carpets, &c. do not belong to the class under consideration. Folding chairs, with nothing distinctive about them, need not detain the visitor.

Portugal.

Portugal has sent several solid and well-made cabinets and sideboards, which will be seen in their furniture court. We may notice a black cabinet and secrétaire by Miguez (2), ornamented with steel nobs or nail-heads. It has a turreted form, and is characteristic, though not perhaps judicious, for the economy of space. Other pieces will also be seen of sober and quiet form and colour, but showing little in the way of artistic design that need claim our attention. Inlaid tables with lines radiating from the centre are to be seen in this court. In the Italian section they are numerous, and are evidently a popular method of ornamentation. The arrangement, however, is so dazzling and uncomfortable for the eye that it can hardly be thought an example for imitation. As work it is excellent. Borrea (4) exhibits solid and well-made furniture of various kinds. Pfaffly (1), also solid and useful pieces. The Portuguese exhibitors send what we desire so much to see in the other competing sections—good specimens of the furniture in ordinary use—and have made no ambitious efforts for the special occasion of the Exhibition.

MR. POLLEN
ON
FANCY FUR-
NITURE.
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Spain.

In the Spanish section, after a long delay, we have some interesting pieces of furniture. A lady—Mdme. Canella, of Barcelona—sends a number of pieces that deserve our careful attention. They are inlaid wood, mosaic, and marqueterie, the former element being preponderant. The pieces partake in general outline of the shapes of French marqueterie furniture. A table in the centre of the court, shaped on the sides in Louis XV. manner, and mounted in metal, loses much of its Spanish character. Still, the surface is covered with pictorial and mosaic inlay in woods, natural and stained. A wardrobe, secrétaire, cabinet, and other pieces, all similarly decorated, are exhibited together. They may be considered as representing the old Spanish marqueterie, so quaint and spirited, that we see in various collections of the 17th century. A number of carved and stuffed chairs, an ornamental billiard table, and an iron bed or sofa are not remarkable for any national characteristic. There is a cabinet, with press below, in light wood, with inlaid mouldings of purple wood, by Pons and Rivas, also of Barcelona, which is worth notice.

We have Gothic and Alhambra-Moorish work in various pieces of furniture, but they are not sufficiently important to be worth special description; nor are they of such a kind as to hold out hopes, like our English furniture for Gothic houses, of greater perfection and convenience for the future.

Switzerland.

In Switzerland Wirth Brothers (9) represent a large house established in Paris as well as in Switzerland, and exhibiting in both sections. The furniture shows the skill in carving in oak and soft woods for which the Swiss are so famous. The cabinet-making, too, is sound and good. Their exhibit is very considerable, and occupies a sort of salon with regular parquet-floor and hangings very prettily set out. They have a stall also opposite to this which exhibits their carved work. The tables are amongst the most successful pieces. The cabinets have been too much loaded and are too heavy in design to enable us to rank them with the highest class of work of this form. The visitor should also observe how the florid abundance and want of restraint of much excellent pierced and carved ornamentation injures its effect. Their best piece is a large sideboard at the back of the court. This is well constructed, and the carving is executed with spirit. It is loaded, and the redundancy of ornament occasionally suggests the notion that it is applied and has not been carved out of the mass. The panels, however, of the lower cupboards are ornamented

with reliefs really cut from the board. The figures at the base of the large glass at the back and those below the side brackets (made to hold plate or china right and left of the glass) are coarse and injure the effect of the entire object. But the proportions are grandiose and the general effect successful. Fluck exhibits a work table extravagant in design but carved with great skill, apparently by ordinary workmen.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Austria occupies a large section of the building, and has contributed the contents of a roomy court to Class 14. The most renowned and one of the most popular exhibitors in the whole circuit is Thonet (35). He exhibits only his chairs of wood bent by steam. They are in more complicated knots, but otherwise are not different from their form and character in 1862. The price, too, is not less than it was then, nor do the greater elaborations of the twisted pieces contribute to such an effect. The house, however, has risen to great eminence in making and exporting, and the Austrian exhibitors have given to Thonet the place of honour.

The best object exhibited in the court is the priedieu and triptych of Leimer. The outer volets or doors have figure-subjects inlaid in wood and ivory, and engraved. The design and engraving are serious and full of life. The design is well drawn, and not over worked. The same qualities are seen in the sculptured wooden Holy Family and figures within. Kramer (19), of Pesth, exhibits a suite of walnut furniture elaborately carved. The work is well executed; the sharp points and breakable pieces might be well omitted. There is nothing peculiarly artistic in the carving. Kitschel (13) exhibits an ornamental iron bedstead. It should be observed, as the most successful effort in this direction, and with these materials, in the building. The cresting, head and foot, are judiciously conceived. There are no sharp points or thin plates to catch in the dress or hangings. The whole seems well put together. A set of furniture is exhibited of corresponding work; but both chairs and tables are inconvenient from their excessive weight; a fall would probably bend the legs or back. Still, the ornament is artistic and well subordinated to the comfort of the sitter. Levehensfelder (17) exhibits a buhl table that should be noticed. The top is the best portion of this piece, but it is well worked. The console-table of Xolb and Trem (17) is bold, solid, and well designed. The hanging festoons might be omitted with advantage. Schenzel (29) exhibits a highly ornamental suite of sofa, chairs,

Austria.

MR. POLLEN
ON
FANCY FUR-
NITURE.

&c. Austria shows, besides these objects, several pieces of marqueterie. The best of these is a table by Linner (18). The colours, though bright and full, are well sobered down by the general mixture of wood, and the legs are carved with skill and care. Cattolica has a table of similar work, also very full in colour and hardly so successful as to harmony of effect. Kreutzigle a similar piece. A more interesting exhibit is to be seen in the small inclosure in the centre of the Austrian furniture court. It consists of two old fashioned presses, ornamented on the exterior with pictorial marqueterie. These are by Meixner, a maker of humble means in the Italian Tyrol. The drawing of the figures is not always as correct as could be desired; but the general tone is agreeable, and reminds us of the class of wood inlay formerly produced in various parts of the Tyrol. Some Gothic furniture will be observed in this court of a flimsy and uninteresting kind.

North
Germany.
Bavaria.

The various North German States, excepting Prussia and Saxony, may be summed up in a few notices. Bavaria has no furniture of importance that comes within the scope of the report for Class 14.

Würtem-
berg.

Würtemberg.—Brauer (1), a set of furniture in ebony, covered with blue en suite. The work is well put together, modest in outline, and comfortable for actual use. It has nothing specially to distinguish it as any national production.

Baden.

Haslinger (1)—Grand Duchy of Baden—an ebony and ivory cabinet; the ivory in the form both of arabesque ornament and figures in the round. The latter are hardly equal to the importance of such a piece of ornament.

Hesse.

Stovesandt (2), in the same section, is more successful and less ambitious in design. The figures are omitted, and the general effect of the piece, which is of the same kind, is better. The Grand Duchy of Hesse has several excellent exhibitors. Mr. Knussman (2), of Mayence, has a complete stall, with parquets, chairs, and table. The character of the ornamentation of the latter, which is the principal piece, is quiet and good. The border is liable to catch dust, but the workmanship throughout is excellent. Heininger (3), also from Mayence, exhibits a cabinet or sideboard ornamented with figures in the round. The sculpture of these is very defective, as the visitor will see; and there are some extravagances in the wing decorations which are salient, and want unity with the mass they belong to. The work, however, is well put together; and the effort towards artistic decoration will lead to more perfect design in the more ambitious portions of such work. Bembé (1) has a

very complete exhibit. A large sideboard, of excellent workmanship, in unpolished walnut, should be carefully examined. No better general design for the form of such a piece of furniture can be seen in the German furniture courts, and nothing about it is above the reach of the workman employed. Some contrast between the relief and saliency of the animals' heads of the lower panels and the quieter work of the upper portion may be noted, but the general effect of the piece is very good.

MR. POLLEN
ON
FANCY FUR-
NITURE.

The Saxon exhibit is more important. Fürpe, the upholsterer of the Saxon Court, has the most important and best executed cabinet. It is in ebony, with inlay of ivory. The work is well carried out; and the fittings, joints, bolts, and drawers are all made with solidity and precision. It comes, in these respects, nearer to the French upholstery than does that of Austria. The designs, however, of both this cabinet and one to be noticed presently are extreme in the heaviness and massive dulness of their general form. The Renaissance Society (14) of Berlin exhibit a cabinet on supports like that of Fürpe, but with double pediments above, both interrupted, which dwarf and weigh down the principal portion of the piece. Friedrich (3), also of Saxony (Dresden), a cabinet in ebony, with other furniture. The same size and solidity of parts and mouldings that are employed in the construction of these cabinets would suffice for much larger pieces, and should be compared with the lighter work of Gillow and Trollope in the English, and Roudillon and Lemoine in the French section, and with other French exhibitors of ebony cabinets of the same form, Bauer Brothers, of Breslau (6), a large buffet, with niches and figures in the front. The design is too architectural to have been intrusted to any but first-rate artists to carry out.

One of the best pieces here is a bureau or secrétaire, by the Association des Ingénieurs d'Allemagne. The ornaments are applied, and not carved on the work itself. Some figures on the wings are unsuccessful, and the upper part generally is less well conceived than the lower. The general lines of division are, however, judicious, and the contrivances of shelves and closets very ingeniously arranged. Bachnart (16) and Geismar both exhibit furniture made of horns and feet of stags and roe. So much has been said in praise of this extraordinary application of horns, and the objections to their use for convenient furniture seem so obvious, that we shall not here enlarge on the subject. As hat-pegs and umbrella stands, these articles

MR. POLLEN
ON
FANCY FUR-
NITURE.

seem well devised. The dust can be brushed from them, and their branches are calculated for this special use. How the dangerous points which bristle on the backs and edges of sofas and chairs, and offer snares to the dresses of ladies and the legs of gentlemen walking or sitting in a room, can be in place in articles made for ease and repose it is difficult to perceive. For hunting-lodges and country cottages, however, these articles are much in vogue; and in 1862, when the merits of this kind of work were much canvassed, all that was exhibited was eagerly bought up, and much more ordered. The public will judge of the suitability of these disputed *points* for itself.

Belgium.

Belgium naturally occupies a considerable position in the Exhibition of furniture and decorations. The quantity of work executed and exported in, and from, that industrious country is very large. Goyers, in oak carving, and Leclercq, in marble chimney-pieces, are instances of makers on the very largest scale, and whose execution is generally liked, while their prices are moderate. While, however, they supply so much to the trade, it cannot be pretended that their work will rank high in the scale of artistic performances of this kind. The most important exhibitors in Class 14 are Snyers Rang (10), of Brussels. Their exhibit consists of a large *secrétaire*, with shelves above and inclosures below, black with ornaments in relief. Also, a brown and black piece of similar kind without the upper portion. There is a third large piece and chairs. The first may be ranked as the most important. It is solid, and will furnish a large room, but is dull and heavy in effect, and wants relief from the great mass of dead black. Black ebony work will always require either surface bas-relief work in abundance of ivory inlay. The piece, however, deserves attention. A small cabinet, with panels of tapestry, and other objects not remarkable are exhibited by Gobart (4), of Ghent. The woodwork is light and well composed, but has nothing remarkable as to carving. The effect of the worked panels is poor, with so much aim at ornamentation in the structure. Snutzel (9), of Brussels, exhibits a sideboard elaborately carved. The work is insufficiently considered, and has a flimsy appearance. A better piece of this kind is a carved table, on a solid base or cupboard and four carved legs by Van Jn-thoud, of Malines (14); also chairs in the same manner, by Verlinden, of Malines (16). It is but just, however, to the makers of objects that are perhaps in demand for the furniture of Belgian houses or for exportation, to note how much of

such furniture is sold as old in London, and also how much better it looks in really old pieces. Slight fractures, worn surfaces, and the discolouration of age (not of paint or varnish) greatly improve furniture that has a somewhat violent effect while white and new; and the exhibitors have had the commercial honesty to exhibit this in its natural, though least attractive garb.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Holland exhibits a good altar with reredos (Cuypers and Stolzenburg) (7). This work is superior to the oak altars in the last section, and both the structural portions, the table and supports, and the light and well-composed reredos, are serious and effective; while the sculpture of certain figures on the back is as good as anything of the kind in the building, except the work of Leimer, in Austria. Dorens (6) exhibits a good console-table, designed in the Greek manner, with glass above. Generally the Dutch gilding deserves attention for its solidity. Van Munster (5) must be noted for his buhl-work. A small writing-table, with shelves above, fairly carved at the top and wings, and two chairs. The table of the one and the backs of the other are incrusted with black bulh-work. It is, perhaps, hardly in place on the chairs; but the work stands alone of its kind in the Dutch court, and is well cut out and inlaid.

Holland.

From Brazil two tables of marqueterie have been sent. They are all that come within the notice of this class.

Brazil.

Cochin-China exhibits, under Government direction, exquisite pieces of inlaid woodwork (teak or harder wood), with peacock pearl-shell. The delicacy of the arabesque and effective disposition of very simple means insure an effect in these works unequalled in this method of decoration. It would be well to compare this work with an elegant toilet-table and glass in the large Italian furniture court, by Giuseppe Bonaiti (23). This is made of Indian walnut, and the inlay is in metal and pearl-shell. The whole design is elegant and light, but perfectly solid, and the tone perfect. There is a table, with native carving on the legs and sides, worth remark; a piece has been secured for the South Kensington Museum.

Cochin-
China.

In the foregoing report an attempt has been made to guide the visitor to a more careful examination of the objects exhibited in the class of costly and decorative furniture. Amidst a scene so full of animation, and an Exhibition so rich in elaborate and splendid objects, it is by no means easy to keep the attention alive, and to form a comparison between the productions of various countries in the same class of work. We are naturally guided by

MR. POLLEN
ON
FANCY FURNITURE.

the geographical arrangement; and the report has gone from one section to another on this principle. Generally we have begun, in each country or section, with cabinets, sideboards, and other such large and important decorated objects, as the greatest amount of art and skill are to be found embodied in these articles. Next we may take tables, chairs, parquets, &c. We may now resume these, in summary, before the visitor.

Summary.

The cabinets best worth seeing are the following:—
French—Fourdinois.—Walnut cabinet, and inlaid cabinet in black and brown. The process of manufacture, in which the wood is let deep into its bed, should be carefully studied.

English—Jackson and Graham.—Ebony cabinet, inlaid with ivory and lapis, and engraved. For excellence of work this should be compared with the cabinet of Grohé, French, the large central piece in mahogany root or red wood. J. and G. also exhibit glass show cases in ebony frames, inlaid with ivory.

French—Roudillon.—Ebony cabinet, with jasper columns and ivory plates, exquisitely engraved. Ebony cabinet or showcase, with glass doors in iron frames.

We may then observe the brilliant marqueterie works of Wright and Mansfield and Jackson and Graham, English; Roux, Grohé, and Sormani, French; Trollope and Crace, English. Of these the satin-wood piece, by W. and M., is thoroughly English, and reproduces work of our very best period. The marqueterie of Roux, Grohé, and Sormani is French. The metal mountings in the marqueterie work of Grohé should be noted for fineness and delicacy of work. Other marqueterie cabinets will be seen in the Russian Court, by Petit; the Spanish, by Mdme. Canella; and in the Italian work of Polli (13). But the interval between the English and French work and that of the Italian, Austrian, and Spanish Courts is considerable.

Ebony cabinets, étagères, &c., are very numerous. Besides the fine examples quoted, we may turn the visitor's attention to those Trollope and Gillow, in the English section; Lemoine and Chaix, and Alessandri; Sauvresy, Meynard, Pecquereau, L'excellent, Gradé, Pelcot, and Charmois (inlaid), Hunsinguer, in the French section; Annoni and Brambilla, and Niccolini, in the Italian; Fürpe, of Dresden; Friedrich and the heavy piece of the Société des Ingénieurs, in the Prussian. In mixed ebony and brown woods we have Gillow, Fürpe, Wirth. In walnut and other brown woods, Trollope, Crace, Gillow, English;

Richstadt, Gueret; Knussman and Bembe, Hessian; Wirth, Swiss; and the Société des Ingénieurs, in the Prussian section. Pietra-dura furniture is mainly exhibited by the Italians. Two cabinets from the Imperial factories at St. Petersburg contain specimens of lapis and the inlaid flowers composed of agate, nephrite, porporine, jasper, turquoise, and many other precious materials, such as are rarely seen collected. The Italian work will not bear comparison with these. Two Florentine tables, made many years ago, and placed beside the modern productions, should be compared with them. Torrini, Polli, Picchi, and Rinaldelli, all exhibit Florentine work of this kind.

MR. POLLEN
ON
FANCY FUR-
NITURE.

Tables we shall see in perfection by Jackson and Graham, Roudillon, Grobé, and the buhl of Roux. The carved consoles of Allard (France), Pohlman (Belgium), Kolb and Trem (Austria), and much good work, gilt or for gilding, in the French section. The ivory buhl of Lucchesi (Italy) should be compared with these fine models.

Filmer (English), Ribal (France), Knussman (Hesse), exhibit tables for general use. Blanchet (France) has the best of the decorated billiard-tables. There are several specimens in France and Italy. Generally, any but the simplest ornament seems out of place in a billiard-table; excellence for the game being the sole necessary qualification for the table.

Chairs—of Jackson and Graham, Sauvresy, Ingledew, Lanneau, Rebeyrotte (French—light and cheap), Gallais, the Austrian bent wood of Thonet, and the light, comfortable chairs from Chiavari (Italian) by many contributors.

Bed-room furniture is best carried out by the white woods of the English makers—Dyer and Watts, Heal, Hunter, Howard, Smee, Spiers and Son. Lemoine exhibits an imitation of the work of Dyer and Watts, and Mazaros and Muntz in oak, carved and plain; Gœkler, Albrecht, Roll, Racault, Hertenstein, Brugeaux, in hard woods. These last are handsome and admirably made, though disagreeable in colour with Brugeaux, and still more in the green of Clere Drapier. For English houses—and, indeed, for all houses, in the general judgment passed on this class of objects—the light, cheerful, clean furniture of our own makers ranks highest. Messrs. Gillow have a large wardrobe, decorated with carving and inlay, of excellent make. Were not the naturalistic carving of the small panels in violent contrast with the classic severity of the inlaid work, it would rank high as an artistic production. Iron bedsteads are exhibited by all the important sections. Kitschel, in Austria, is the most successful as to ornament. Winfield and

MR. POLLEN
ON
FANCY FUR-
NITURE.

Peyton show well for good make in our own. Vericchio for spring mattresses. We regret the tawdry ornaments in brass and enamel that injure the effects of some of our best work of this kind. Brass bedsteads cannot be too plain, as long as they are substantial, well joined, and entirely free from points, edges, or thin plates that catch in the bed-clothes or the dress.

Invalid and mechanical chairs are exhibited by Ward and by most of the competing countries. The mechanical furniture of Austria for packing and transport from house to house, in the machinery-gallery of that empire should be studied.

Chinese lacwork is exhibited in its perfection in the Japanese and Chinese sections. Imitations are to be seen in Meyer Raulin (French) and in the lacwork of the Dutch section. Our own exhibitors of Birmingham, represented by Betteridge, send all kinds of this work, but of their own designs, and admirably executed.

The Oriental work of the Turkish and other sections is more curious than valuable as examples for European use. The good pearl and wood inlay of Turkey, and the exquisite work of Cochin-China in this way should be studied.

Parquets.

The visitor will not fail to see how universal, everywhere but in our own section, is the exhibit and manufacture of oak parquet floors. Those of Belgium, which are made and screwed down in large pieces many feet square, are the most convenient. But most sections exhibit them very accurately made. Great varieties are to be seen in the Swiss section, and splendid specimens in the exhibit of Marcellin (French).

Buildings in
the park.

There are various buildings more or less splendidly furnished. That of the Empress, in the Horticultural Garden, is the most finished and successful. In it the visitor will see a thorough specimen of French care for unity of colour, tone, and effect.

It must be remembered that the report specifies only a few of the most noteworthy objects; but many more, indeed most of the objects exhibited, deserve the greatest praise. The distinctions of medals show frequently but a few slight points of superiority in the work of one exhibitor over that of another, where both are still excellent. And connoisseurs will regret that so many interesting objects are to be seen only for a short time, and that the choice examples cannot be kept permanently together for study and comparison.

REPORT ON DECORATIVE WORK and UPHOLSTERY.—
(Class 15.)—By M. DIGBY WYATT, Esq., Architect.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

THERE is, probably, no class of the community upon whom international exhibitions confer greater benefits than the individuals who act as jurors on such occasions; since the opportunities afforded to them of "taking stock," as it were, not only of the material, but of the intellectual, progress made by each nation in special branches of industry, are of the most favourable kind. Such opportunities obviously include an unrestrained interchange of ideas and comparison of impressions and experiences between those in each country who may have been selected to represent, and may therefore be assumed as likely to exercise a marked influence upon, the particular branches of industry with reference to which they may have been called upon to exercise the functions of jurors. While it is depressing on the one hand to observe retrogression, it is, on the other, delightful to note advance, and to have to record the steps by which auspicious change may have been effected, opening up vistas of increased remunerative employment for skilled labour, and a consequent amelioration in the social position of those who have to live "by the sweat of their brows." Having closely followed the details, in their relation to industrial art, of each international exhibition since the first ever-memorable experiment in 1851, I am happy to be able on the present occasion to place on record my impression that never in the history of labour has change more rapid, improvement more uniform, or present excellence pregnant in a higher degree with future still greater perfection, characterised any corresponding period than has distinguished the forward march of the arts of decoration in the principal nations of Europe during the last 18 years. What the Germans call an "Entwickelungszeit," or "transitional period," may be fairly dated from the year in which producers began "to gird up their loins" in preparation for that noble rivalry of nations in the arts of peace which culminated in the fierce industrial tournament of 1851; and from that date to the present there has been an incessant sharpening up of the intellectual weapons, and remedying defects in the armour, of those who took the most conspicuous part in that great *mêlée*. In no branches of industry do this care and energy make themselves more manifest than in those which are

Benefits
conferred
by Inter-
national
Exhibitions.

on jurors
especially.

Progress
effected
since 1851.

Generally.

And in
classes 14 &
15 espe-
cially.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Apparent
obvious
connection

between
decoration
and cabinet
making.

Deficient
space in the
Exhibition
for display-
ing this
combina-
tion.

A title to
adequate
space in
future exhi-
bitions sug-
gested as a
class of
reward.

comprehended in classes 14 and 15 of the Exhibition of 1867.

Immediately upon the assembly of the jurors of those classes face to face with the objects they were called upon to judge, it was recognised that it would be scarcely possible to establish, practically, a strict line of demarcation between what should rightly constitute the "hunting grounds" of each; and it was therefore resolved that all productions should be regarded as common to both which could be assumed as ministering to man's enjoyment by making his domestic hearth, taken in its widest sense, the abode of beauty. Distinctions which may be perfectly reasonable upon paper and consistent with sound principles of classification, become obviously inapplicable when their limits are overstepped in a great number of objects forming the staple produce of manufacturers whose habit it may be to blend in their trade the various branches artificially separated from one another in a catalogue for the sake of classification. In practice it is indeed most satisfactory that this blending should exist, for without it there would be little chance of any harmonious result in the fitting up of a house. Unless the provinces of the decorator and of the cabinet-maker are to a great extent incorporated there is every likelihood that instead of the labours of the former being subordinated to those of the latter, the effect of the most elaborate furniture will be overpowered by the greater brilliancy of the walls and ceilings; while, on the other hand, should the decoration be really a work of art, unless the cabinet-maker or upholsterer be a man of taste and self-denial his marqueterie and inlays, and his florid carpets and curtains, will reduce the painter's work to comparative insipidity. It is one of the greatest defects of the present Exhibition that the number of those desiring to make a display of their talents has been so great as to make it impossible to accord to any one firm sufficient room for effectually and effectively representing the complete equipment of an apartment. In fact, the multitude of small exhibitors in group 3 of the present Exhibition is such as to make it desirable that some steps should be taken to make the relative position of exhibitors rewarded by the jury on the present occasion the basis of prescriptive right to allotments of space of exceptional extent in any future Exhibition. To win such a right would at any time, I have little doubt, procure a most active competition and a steady maintenance of excellence, since the conclusion that future success could only be founded on present activity would force itself most keenly on the attention of manufacturers.

Younger partners would stir up heads of old firms, who, having already carried off golden spoils from the past, are apt to get somewhat apathetic with regard to the future, and many a fresh start would result.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Amongst the germs of such "fresh starts" shown in the present Exhibition, none are more important as affecting the arts of decoration in the future than the new life which in all countries appears to have been infused into the revivals of the manufacture of terra-cotta, of the application of enamel and vitrified colours upon earthenware or metallic bases to the general purposes of the decorator, and of the art of mosaic-working in every form. These revivals have as yet most largely affected "furniture, ornaments, and decorations for the services of the church"—items specially included in class 15; but there are many indications that they will be rapidly extended in every direction into "civil structures" of every description, from national museums to ladies' boudoirs.

Chief novel-
ties in deco-
ration of
present
Exhibition,
viz.,
Terra-cotta,
Enamel,
Mosaic.

The materials and the processes of earthenware making and glazing, and of enamelling and mosaic working, will, no doubt, be duly noticed by the reporters on ceramics, metal-work, and the use of both in structure generally. My function will, therefore, be limited to a notice of the application of those processes to *decoration* generally.

Limits of
this report,
noticing
these novel-
ties under
their deco-
rative aspect
only.

In enumerating these "fresh starts" terra-cotta has been put first because it serves not only by itself as an element of decoration, but as also furnishing the earthenware base for enamel colouring. Italy, the country in which the art of terra-cotta working was carried furthest in the Middle Ages and during the period of the Renaissance, still retains much of its ancient skill; and it is to be regretted that Boni, of Milan, alone appeared to be present; while Furlani and Bacci, of Florence; Papi, of Sienna, Martinoz, of Palermo; and Vanni, of Impruneta, are unrepresented at the present Exhibition. This is of less consequence since Boni's archway and panelling in the park are very meritorious, and since fine specimens of the productions of several of the absent manufacturers may be studied in the museum at South Kensington. The Italian terra-cottas are soft by comparison with those of France and England, ranking, however, in hardness and resistance to humidity before those of the Eastern nations, and of Portugal and Spain. It is much to be doubted whether they would stand the alternations of soaking rain and sudden frost which distinguish our northern climate. The best French contribution of terra-cotta is by Virebent, of Toulouse, whose work in former exhibitions has been better than it now is in point

Terra-cotta.

Italian.

Spanish.
Portuguese.

French.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Prussian.

Austrian.

English.

Represented
by Messrs.
Blanchard,

and Mr. J.
M. Blash-
field.

Work done
for the new
India Office,
the Depart-
ment of
Science and
Art, the
Marquis of
Northamp-
ton.

of form. My jury also commended the terra-cotta work of Mdme. Veuve de Bay, which is connected with the chapel in the park, and which, as subservient to the decoration of the church, fell within their province. March, of Charlottenburg, near Berlin, shows, by a large archway in the gallery of machines, how well fitted he is to cope with the supply of architectural terra-cotta work upon the most massive scale. His goods (as are those by Drasche, of Vienna) are extraordinarily cheap. Those who remember Schinkel's Bau-Academie at Berlin will be assured that good terra-cotta work is no novelty in Prussia.

In England, as is well known, the old establishment of Coade, for which Bacon and other sculptors worked so much, produced a great quantity of bold terra-cotta; but, after the decline of that firm, for a considerable period the art languished. Sparks of the old fire still lingered in the embers of such firms as that of Messrs. Blanchard; and these have been blown into a new life by the rapidly-increasing demand for some material more durable than most of the common building stones under the deteriorating influences of such an atmosphere as that of London. To no one is the revival of the art of terra-cotta making more indebted than to Mr. J. M. Blashfield, of Stamford. His acquaintance with the constituents of the English clays and with their treatment by the addition of foreign substances so as to obtain perfect vitrification without distortion; his elaborate experiments upon the best forms of kilns, fuel, cooling, &c.; and especially his natural taste for sculpture and for models of the purest form only, have borne good fruit in England, and raised the manufacture into one of really national importance. His exhibition this year appeared to the juries of classes 14 and 15 to be so important to classes 17 and 65 that it was determined that he should be referred to them; but great admiration was expressed for his large mediæval window for Dulwich new college, from designs by Mr. Charles Barry; his chimney-piece, executed for the new India Office, and for many other admirable specimens of his skill; not omitting the base of the large compartment of terra-cotta work executed for the Department of Science and Art, and exhibited in the outer circle of the building. It is to be regretted that his limitation as to space prevented his contributing some of the great garden decorations he has executed from my designs for the Marquis of Northampton, at Castle Ashby. These, including the entrance-gate piers, are as yet, I believe, unequalled for extent and excellence of manufacture by any terra-cotta work done in England. This work will,

however, have to yield the place of honour to the immense works done, in progress and projected, for the buildings of the Horticultural Society, the great central Royal Albert Hall of Arts and Sciences, and the buildings of the Department of Science and Art. What has been as yet done has been mainly executed by Messrs. Blanchard, and in a style which reflects great credit upon the skill and dexterity of the firm. Many of the ingenious arrangements for the adaptation of the terra-cotta work for structural purposes were due to poor Captain Fowke, while to Mr. Godfrey Sykes we are indebted for much very beautiful design and modelling. Both, alas! have died too early for their country and their friends. Of the success of the united efforts of Captain Fowke, Mr. Sykes, and Mr. Blanchard, the Department of Science and Art gives admirable evidence, both in the outer zone in the building, and in the testing-house in the park. In these fine specimens the ornamental portions—as, for instance, the figures and foliage, and their combination in contrast with lines of mouldings and inclosing forms—leave little to be desired; and it is rather in the quantity of the architectural parts, in the balance of the due proportion to be maintained between functional and non-functional components of the structure, that the result falls short of perfection. After allowing for such small defects, there yet remains behind ample evidence of daring novelty and general capacity; and all who may hereafter perhaps improve upon these experiments (for such, though conducted upon a vast scale, they were) will have reason to be thankful that they were made, and so healthy an impulse given to the manufacture at a moment when it most unquestionably needed it.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Services
rendered
by Captain
Fowke and
Mr. Godfrey
Sykes.

In Austria, Henri Drasche, of Vienna, makes a very effective though unequal show in the park. Four of his candelabra, after a very good model, and two or three of his vases, of which some have twisted a little in cooling, are beyond the average of such goods in all respects.

Austrian
terra-cotta
by Drasche.

The next stage in adapting terra-cotta for decorative use, consisting in giving it an enamelled surface upon which vitrifiable colour may be floated, has been well attained in every country from the East to the West. In Prussia, perhaps, more successfully than in any other, since nothing can excel the admirable white stoves of several of her leading manufacturers. These are, however, quite equalled by a capital specimen shown by O. H. Akerlind, of Stockholm. The reporter upon ceramic art will, no doubt dwell upon the amazing development which has taken place in the revival of all the old processes of "faience," "majolica," and

Terra-cottas
with
enamelled
surfaces.

Prussian.

Swedish.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

English.
French.

Excellent
reproduc-
tions of
Persian and
Palissy
faience in
France,—

And original
works.

“mezzo-majolica.” We in England have mainly taken up encaustic tile-making, and imitation of the Azuleijos of Spain, in which Minton and Maw so greatly excel; while in France the faïences de Perse have engaged most attention; and next to them the revival of faïence à la Bernard de Palissy. Of the former of these two, in its application to decorative purposes, the Imperial Manufacture of Sèvres, and the exhibits of MM. Deck, Collinot, Rousseau, Laurent, Utzschneider, and Macé, furnish most admirable specimens; and of the latter the exhibits of MM. Avisseau, Signoret, Jean, Barbizet, and Pull. By the last-named a chimney-piece in the faïence court, imitated from a well-known one by Bernard de Palissy, in the Louvre, has been manufactured as a *tour de force*. Both these revivals are so successful as to deceive the eyes of any but accomplished connoisseurs, and for every decorative purpose, for which the originals were ever employed, these reproductions of the nineteenth century are equally available.

It is somewhat unjust to French ingenuity and talent to characterise all that has been produced in these branches of industry as “reproductions” only. It is one of the special characteristics of the Gallic temperament that it can never be satisfied with simple reproduction. Of this tendency I had many amusing instances in endeavouring to keep the French sculptors of ornament to a strict restoration of fragments, damaged in the original models, of the portions of monuments set up in the courts of the Crystal Palace. It was scarcely possible to turn one’s back for a few hours without finding, on returning, that the workman had been attempting to smuggle in a little “motif,” as he called it, of his own. A comparison of the “style de l’Empire” with real classical work will at once prove how hard it is for a Frenchman to copy when he has the slightest chance of originating. In industrial art this tendency is an element of progress of inestimable value; but I may be pardoned for noticing here that it is tending every day, in the insidious guise of “restoration,” to the destruction of the value in relation to the history of art of the ornamental, and in some cases of the structural, details of almost all the great relics of decorative art in France. May there long be averted from our royal and noble tombs and monuments the operations which those of France have in some cases undergone, and with which in others they are threatened!

French
Sèvres.
Faïence
pictures on
the “dis-
sected map”
system.

To return to the details of these ceramic revivals, the student will do well to observe a process which unites the use of enamelled faïence with the principle of mosaic work on the “opus sectile” system of the Romans. Of this two

ambitious examples will be found on the walls of the Sèvres Court, painted by no less able an artist than Yvon. The method of working has this in common with that by means of which a picture in stained glass is produced, that in both the artist makes his cartoon, and so arranges his composition that the whole surface of the picture may be cut up into a number of pieces, without allowing any of the lines in which the cuts are to be made to interfere with the leading forms or surfaces. Pieces of common earthenware in the one case, and of glass in the other, are then cut out, or otherwise made to correspond with the various portions into which the original design, or cartoon, may have been subdivided. The earthenware is then floated over with a white enamel, and handed over, as the glass is, to an artist to paint in vitrifiable colours until each piece is made to correspond with its model in the cartoon; after which both are passed through the kiln and fired to make the colouring permanent. The glass is then handed over to the glazier, whose lead lines fall exactly into those of the subdivisions of the cartoon; and the earthenware to a mason, who fixes the several pieces against the surface to be decorated, and then "points up" his joints, which correspond in all respects with those of the lead lines of the glass picture, excepting that many of the minute subdivisions, separating colour from colour, which are necessary for the transparent may be omitted for the opaque picture. This method of making up opaque pictures was, and still is, practised in Persia and India, and by all the minor Orientals whose arts are founded on those great fountain-heads of art-inspiration; but the use of this mosaic arrangement of plaques of faience is by them generally restricted to ornament and the formation of different compartments for the reception of ornament.

MR. DIGBY
WYATT
ON DECORA-
TION, &c

Analogy of
process with
that by
which
pictures in
stained glass
are pro-
duced.

Process of
Eastern
origin.

The pictures in question, in spite of the reputation of the painter, are not in all respects satisfactory, but they are sufficiently so to prove the efficiency of the process; and I cannot but believe that for our climate, in which frescoes do not appear to be able to live, this process appears to offer almost the only means by which the painter's art can be combined with the sculptor's and architect's in monumental structures, at any rate, externally. It is one by means of which the artist realises his own conception, instead of its having to pass, as it were, through the more or less perfect "translation" of the pictorial mosaic worker; its permanence ought certainly to equal that of any mosaic; and it ought to be produced, at the utmost, at one third of the price of a mosaic rendering of the same theme in the same colours. It appears to me specially available for painting in "grisaille"

Perma-
nence,

and cheap-
ness of the
process;

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

its suita-
bility for
England.

Suggested
reproduc-
tion of
Raffaellé's
cartoons by
means of it,
in combina-
tion with
photo-
graphy.

Rousseau's
specimens.

Ingredients
procurable
for experi-
menting.

Improve-
ments in
Maw's and
Minton's
majolica.

Painted
plaques,
French.

or "camaieu," as in either of those methods the joints, when pointed up in the fundamental colour, might be made to almost entirely melt into the general tones of the picture. It is, in fact, a process for which there exists, I believe, a very considerable future; and I can conceive few more excellent ways of educating some young students or artists in England than would be afforded by setting them to reproduce—with the assistance of photographs, full size, of the various heads and principal parts, which might possibly be transferred to the surface of the white enamel by the process of M. Joubert, or by some other, such as that shown by M. Poyard, of Paris—the cartoons of Raphael. Very slight modifications, as in large masses of monochrome drapery, would be necessary to adapt these compositions for reproduction in coloured faience; and once burnt and fixed to the walls, say of the new buildings for the Department of Science and Art or of the proposed Albert Hall, we should have succeeded in placing on record, in an all but imperishable form, those great masterpieces whose existence only upon perishable paper or in imperfectly-executed tapestries gives but a poor pledge for their future perfect preservation.

Already this method is passing in France from the establishments of the State to the ateliers of private industry, and a very fair sample of what may be readily produced therein is shown by Mr. E. Rousseau, of Paris. It may possibly be useful to amateurs and others who may desire to make experiments in the by no means difficult art of painting on faience, to know that colours duly "fritted" may be procured in Paris of M. Guyonnet-Colville, Rue des Vinaigriers, No. 34, or of M. Lacroix, Rue Parmentier, No. 8, who exhibit very perfect specimens. Those who may desire to go more closely into the whole of the technical processes may be referred to an excellent work by M. Salvétat, principal chemist to the Imperial manufactory at Sevres.*

In our own country the tiles of Maw and Minton are too well known and too much used to need notice here; it is enough to say that both were excellent and highly appreciated by foreigners, who recognized a marked advance since 1862 in the evenness and brilliancy of the transparent enamel colours used on the majolica tiles of the first-named house. In Portugal some very good common faience tiles were shown. In France, however, the progress made has been most rapid, and the tiles made in imitation of old Persian examples are first-rate in quality and effect. Some

* "Leçons de Céramique Professées à l'Ecole Centrale des Arts et Métiers." Paris : Eugène Lacroix.

of the large faience plaques painted by artists of the first distinction, such as Hamon, Anker, Ranvier, Lessore, and Bouquêt, are both of large dimension and admirable design, realized in the liveliest colouring, and with a happy freedom of handling which betrays the dexterity of the highly educated and accomplished artist. The little landscapes by the last named are extraordinarily full and brilliant. Such plaques are veritable pictures, and for insertion in architectural frames, as for over-doors, in chimney-pieces, or simply as panels enclosed in a modest framework of mouldings formed upon the surface of external or internal walls, nothing could be more suitable for our climate, or more likely to produce agreeable and permanent effect in decoration. Similar plaques, with more or less brilliancy of colouring and excellence of drawing, are shown by Wedgwood and Minton, of England, and by Dutch and Belgian manufacturers.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

English,
Dutch, and
Belgian.

Gille Jeune has a chimney-piece entirely in china, the design of which is unpleasing, but in which the manufacturing difficulties have been well overcome. Charles Poyard's burnt-in photography on the surface of china is perfect in black, umber, brown, and Pompeian red; and his successful experiments show us that the chiaroscuro, being rendered in either of those tones, may be floated over with enamel colours, so as to produce a fully tinted picture at a very moderate cost.

French ex-
hibitors.
Gille Jeune.

Poyard.

H. Pinart exhibits the results of a process calculated to greatly facilitate the labours of the amateur. He prepares a liquid into which the terra-cotta object is dipped. As soon as this liquid is dry, which takes place in a few minutes, he proceeds to paint upon it with colours which he prepares. The painting finished, the object is consigned to a furnace, in which it is baked. The result is that one operation fixes the ground and the colours, and leaves upon the surface a light and agreeable glaze. The colours in the kiln slightly blend with the stanniferous enamel covering (corresponding to the adobe of mezzo-majolica) and produce an agreeable effect of transparency. Jean, of the Boulevard Malesherbes, Paris, employs the original clay of Nevers, and, by means of its use, has succeeded in giving great hardness to his productions, both in the clay and in the subsequent application of the enamel colours. He exhibits a "torchère," some 8 ft. high, in which he has overcome many very great difficulties in the potter's art; and a fountain of large dimensions, of which the design and colouring are remarkably good. Signoret, of Nevers, also works the old Nivernais clay successfully, and his large "cistern" has the real "chic" of an old specimen.

Pinart.

Jean.

Signoret.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.
Collinot.

I cannot quit this branch of the decorative aspect of faience without commenting specially on the invention and genius displayed by M. Collinot. An old "officier en retraite," this gentleman has profited by his studies in Algeria and the East, while in service, to found now in his retirement an admirable industry. In a small pavilion within the building he has so grouped specimens of his imitations of Oriental faience as to demonstrate the part they may be made to play in architectural embellishment. His Persian tile wall linings, his little fountain niche, his vases with decorations in colour "incrustés," and the cornice columns and window of his pavilion are worthy of most careful study, and are more truly "inspirés de l'Orient" than the work of any other manufacturer of a similar class of goods, except perhaps M. Deck. The estimation in which his productions are held in Paris is proved by their immediate sale, at good prices, to persons known to possess most highly cultivated taste.

Deck.

Enamels on
metal bases.

Turning now to the employment of enamel colours on metallic bases, it is right to observe that this art is one which has never fallen quite into desuetude; but, on the other hand, it has never yet taken up the position which is, I believe, reserved for it in industrial art. As early as the date of the Parisian Exposition of 1849, the Royal manufactory of Sèvres exhibited one or two large sheets of wrought iron covered with artistic paintings in enamel in grisaille, in imitation of the enamels of Reymon, Ponce, and other masters of the latter part of the sixteenth and the beginning of the seventeenth centuries; and at each exhibition since that date exceptional evidence of the power to supply a demand for such goods, should it arise, was manifested. The English had contemporaneously, and steadily, exhibited their power to supply a similar demand; but their products were limited to the manufacture of objects of domestic utility.

On iron.

French.
English.

In 1849.

Mr. Cole and I examined the Sèvres enamels on iron together attentively in 1849, and on our return we both, I believe, endeavoured to induce manufacturers to take up this branch of production. The future we both foresaw for such art workmanship; which would not, however, be suddenly called into existence at our bidding. Time alone was wanting.

Now.

Future of
the trade.

On the present occasion both nations show that the long-expected demand has arisen, and there is no doubt that a great trade will soon grow up in iron plates enamelled and painted, not only for lettering, signboards, name-plates, &c. but for ornamental tablets of all kinds available for introduction into the decoration of buildings and furniture. Messrs.

Baugh & Co.
E. Paris.

Baugh and Co. of Birmingham, and Messrs. E. Paris, of Bercy, near Paris, make an almost exactly similar class of goods, and their businesses are increasing most rapidly. The Department of Science and Art, with a most laudable activity, has been endeavouring to direct this branch of manufacture in England into a more artistic line than it might have otherwise assumed, and exhibits an interesting specimen of an application of iron enamelled plates, decorated with diaper patterns, to the formation of ornamental fireproof ceilings. By this method of construction, "instead of using wooden laths between the iron joists of the floor, and making the floor of concrete and the ceiling of plaster, the enamelled ceiling supports the concrete and supersedes the plastering." Such is Mr. Cole's description of his idea, and he adds that such "ceilings may be made either of pottery or of iron enamelled. They are much more easily cleaned, and are more fireproof than the old mode, and admit of any amount of decoration that may be required." Care should, of course, be taken in using such ceilings, to guard against any disagreeable consequences resulting from rapid condensation upon the surface of the enamel, and in their construction from overweighting the enamel plates with concrete, causing the plates to "bag" and "bulge." The idea is a good one, and will, no doubt, be improved upon and made largely serviceable. Should we ever have a new National Gallery, it would be peculiarly suited for use in its construction. It is to be regretted that Messrs. Baugh and Co., of Birmingham, by whom the plates made for this ceiling were manufactured, should not have exhibited on their own account, as I believe that the display of such an ornamental roof as that which they have lately put up over Mr. Charles Buxton's drinking-fountain at the corner of Great George-street, Westminster, misapplied as it certainly appears there, would have been one of the most important novelties as affecting the future of external decoration in England. Their absence is, in some degree, compensated for by the presence of Mr. Skidmore, whose very important works in ornamental metal-work combined with enamelling, for the monument to the late Prince Consort, and for much ecclesiastical furniture and decoration, show strong indications of the rapid progress which has been lately made in England towards a general utilisation of the processes of enamelling on metal bases. It may be especially noted that Messrs. E. Paris and Co., of Bercy, show specimens of enamelling upon cast, as well as upon wrought iron.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Mr. Cole's
iron ena-
melled
ceilings.

Mr. Skid-
more's
efforts.

It is in the perfection of the artistic decoration of such enamels upon a small scale that the French have of late

Miniature
painted
enamels.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Lepec.

Meyer.

Cloisonné
enamels.
Christofle,
Barbe-
dienne.
Champs
levés
enamels,
Thierry,
Rusand.
Others by
Dotin, &c.

Suggestions
for develop-
ment of
artistic
enamelling
in England.

made such great strides. The beautiful enamels of Lepec are painted with a richer palette, and with more subtle effects of metallic lustre and translucency, than any enamels, ancient or modern, which I have ever yet had an opportunity of seeing. He is an artist of first-rate merit, and his productions (the best of which are noble commissions from Mr. Alfred Morrison) will hereafter be treasured in "museums of the history of labour," with the most precious relics of Leonard Limousin, Courtois, and other great masters of the French Renaissance. While Lepec's style is altogether original, the extraordinary spirit of these masters' work is perfectly imitated by M. Alfred Meyer, an artist attached to the Imperial manufactory at Sèvres. Amongst his works a series of small decorative panels adapted for use by jewellers, and a larger panel suitable for insertion into a cabinet or other piece of furniture, and representing the head of a lady, with an inscription beneath commencing with the words "Sola manet virtus," are worthy of the most careful study by those who would desire to revive this branch of the art of enamel-painting in England. The aptitude of the French, for the perfect imitation of the cloisonné enamels of the Byzantine Greeks is shown capitally by Christofle and Barbedienne, for the reproduction of the German and Limoges Mediæval Champs levés enamels by Thierry and Poussielgue Rusand, and for that of the works of the later French enamellers by Dotin, Robillard, and Charlot—all art workmen of remarkable skill, and whose productions daily deceive in the "bric-à-brac" market (as do those of Salviati and Cortilazzo in other departments) all but the most accomplished connoisseurs.

I have dwelt with more enthusiasm upon the works of these artists because I know full well how easy it would be in England to rival, if not excel them. The multitude of admirable woodcut illustrations which appear week by week in England prove incontestably that we have an abundance of young artists perfectly capable of doing such work if some of them would but pay attention to the few simple processes essential to be mastered; and, if this evidence should be insufficient, the progress made of late years in the designing and execution of stained glass would indicate our national capability to excel in any similar class of production. What is really wanting in England in the decorative arts at the present moment is far more intelligent demand than capable producers. It is, however, scarcely just to complain when such a wonderful awakening to what is good has taken place within the last ten years on the part of both buyers and producers. Of one thing at least I am certain, that, rapid as

may have been the progress of all other countries in this direction over the same term of years, and whatever may be the position of England as to the diffusion of taste and the popular correct judgment of beauty, our advance has been relatively more rapid than that of any country; and in no land are the prospects of that advance proving continuous and strenuous more auspicious than in our own. What is specially observable in France at the present time is the prevalent combination of a general intellectual activity of interest in the fine and decorative arts of the hour, with a corresponding lively appreciation of the past. The French designer is always seeking "*de s'inspirer*"—to pick up from the past something which he may use in the present. He recognizes the fact that novelty can be rarely anything but re-combination; and that, addressing himself to the gratification of the tastes of those whose eyes have been educated on the enjoyment of the best works by which they have been surrounded in the monuments of France from their earliest age, he can scarcely please unless his ideas are more or less cast in the moulds to which his clients have been accustomed. This it is which leads modern French designers to such a reverential conservation of the styles of Louis XIV., XV., and XVI., with all their *naïvetés*, *bergeries*, *chinoiseries*, &c. The style "*Cul de lampe aux vignettes vaporisées*" is never likely to be much less popular in France than it is now, or than it was when Boucher, Vien, Vanloo, Le Clerc, Eisen, Marillier, Gravelôt, and other charming artists brought it first into vogue. We, being a little wanting in the possession of such rich traditions of decorative excellence as the French possess, should but the more energetically exert ourselves to create something in the present which may supply the deficiency in the future. We have only to continue to improve in the next ten years as we have in the last ten years and the thing will be done.

We may now proceed to "take stock" of the remarkable revival which presents itself in the shape of mosaic work, an art for the general resumption of which I have long foreseen an almost inevitable necessity. For the last 20 years everything has been steadily tending in that direction. When I first visited Italy in the year 1845, carrying with me a strong sense of the kind of fruit which must grow from the seed I saw Welby Pugin, Eastlake, Dyce, and Owen Jones planting, I at once recognised in mosaic the special desideratum for our necessities in the art line, under the peculiar conditions of our abounding smoke and damp. On my return in the year 1847, at a meeting of the Royal Institute of British Architects, I stated that I saw no reason

Mosaic.

Its revival
in England.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Its special
value in our
climate.

Its various
processes.

whatever why we should not carry out in the various processes of mosaic "exactly what the Greeks and Latins practised of old." In 1862 I stated in the same room that "if I was justified in that remark in 1847, I am more than justified now; for, happily, many practical difficulties formerly existing have been removed, and convictions as to the eligibility of the revival entertained by a few then are now heartily sympathised with by many, able not to dream and desire only, but to work and to do." So strongly, indeed, is the current now setting in, that I feel convinced it will be ere long incumbent on every architect practising in the higher walks of the profession to make himself acquainted with the best mode of dealing with what, when once adopted, will, I do not doubt, become the most popular means of adding the graces of colour to the refinements of form and proportion. Mural painting must, in our climate, ever have to contend with elements certain to shorten its ephemeral beauty. If attempted in real fresco, damp, fog, and frost speedily fasten upon its very vitals, tending to set the lime against the oxides and other pigments, which in time are eaten away, as even in Italy we frequently see them, into nothingness. "Fresco secco" is still less permanent. Tempera, or distemper, I need not waste a word upon. Oil or encaustic painting involves the use of vehicles, darkening, turning yellow, shrinking irregularly, and ultimately often detaching themselves from the ground to which they are applied. What, then, is left to us if we would have our decorations live after we have ceased to live, but those processes over the most delicate and the boldest pictures produced by which experience has proved that a thousand years may pass and "steal no grace away"?

Upon the nature, varieties, aspects, capabilities, and uses of these various processes, great confusion exists in the minds of the general public, and they are, indeed, well known only to a minority of those who will very shortly have to deal with them as everyday elements of decorative effect. It may therefore not be useless to enter upon this subject in some little detail historically, promising not to similarly commit myself in any other section of this report. Believing that it may be well to extend to a general auditory the information already given to a professional one, I do not hesitate to condense from a paper I read not long ago before the members of the Royal Institute of British Architects, a few particulars touching the main historical phases of pictorial mosaic, of revivals of almost all of which specimens may be seen in the International Exhibition. These I believe to have been the following seven:—viz., 1st, clas-

sical; 2nd, Latin; 3rd, Byzantine; 4th, Greco-Italian; 5th, Italian monumental; 6th, Italian portable; 7th, mosaic in *pietre dure*.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

The first or classical is well known in its general aspect; but as the foundation of all the other styles, it demands a somewhat closer view; the more especially, I think, because this closer view may enable the architect to realize some distinctive features in ancient decoration revealed to us through no branch of art more distinctly than through mosaic. In the Roman decoration of Imperial times two distinct schools may be traced; the one most ancient—founded on Egyptian, Dorian, and Etruscan models—chiefly affecting monochrome combinations of black and red or buff, or delicately coloured subjects and ornaments on uniformly flat grounds; and the other rejoicing in the glowing tints and golden and spangled grounds of the East, popularized after the spoils of Ionian, Corinthian, Phœnician, and Syrian magnificence had given that taste for gorgeous costume which led to the substitution of the Babylonian embroidery and figured tissues in costume and wall hangings for the simpler stuffs indulged in during the Republican ages. Whether the art of fabricating gold ground mosaic was of Oriental discovery, or whether, as is more likely, it was derived from the north of Africa, the nursery of the glass and enamel trade, are as yet unsettled points; but that it was freely adopted in Imperial times is proved by the various specimens still existing at Pompeii and Naples. It is certainly curious to remark how devoted the ancients were to tessellation as a system, whether in the finest or coarsest examples. Large surfaces of uniform colour are invariably made up of small cubes, little varying in size in any portion of the work. No special labour is bestowed on fine joints, and no effort is made to disguise their effect by using coloured cement stoppings. The jointing was evidently accepted as an artistic convention, and with good taste and judgment it was kept regular, so as to prevent its distracting the eye from the pictured forms. Its lines were invariably made to subserve, by contrast, the effect of the flowing contours wrought by means of it; and no effort was made, by the use of large slabs combined with tesserae, to save the labour or expense consequent on reducing the whole to one uniform gauge of size or rectangularity. This reduction of all to a common modulus is one of the sources of that appearance of flatness and repose which peculiarly marks all well designed pictorial mosaic. Such regularity is infinitely more important than fineness of work. The best specimens of the value of this adherence to gauge over large plain surfaces with which I

I. The
classical
phase.

Its leading
subdivi-
sions.

Original
processes.

Appearance.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Chief speci-
mens.

Ultimate
processes.

am acquainted are those noble black and white pavements and wall and vault linings which abounded in the baths of Caracalla, at Rome. To those familiar with such mosaics as those of the "Battle of Issus," from Pompeii; of Pliny's "Doves," in the museum of the Capitol at Rome; of the fine pavement found amidst the ruins of Hadrian's villa, at Tivoli, now in the Hall of Masks in the Vatican; of the splendid arabesques and head of Minerva brought from the site of Cicero's village at Tusculum, and now in the Hall of the Greek Cross, it is needless to state that in all that constitutes perfection in graphic imitation the fine *opus vermiculatum* of the ancients left nothing to be desired. Not only were form represented by light and shade, and local hues expressed by positive colour, but the utmost refinement of gradation of warm and cool tones, in shadow tints and reflected lights, were accurately copied from nature. Even in that curious mosaic removed from the Temple of Fortune to the Barberini Palace at the ancient Præneste, now Palestrina, in which the learned have recognized the identical primitive specimen referred to by Pliny, in the words "*Lithostrata cœptavere sub Sylla æstat quod in Fortunæ delubro Præneste fecit,*" a great variety of colouring and much minute execution in the animals, figures, and landscape are to be observed. For the production of such vivid and varied tints natural, self-coloured materials, such as marbles, stones, &c. could not suffice; and the skill of the glassworker was therefore pressed into service to enrich the mosaic worker's palate. For him not only were vitreous pastes prepared, glowing with every colour of the rainbow, but chemical processes for staining and tinting natural materials were brought into use; and, finally, the vitreous pastes were overlaid with gold, covered in its turn by a thin film of pure white glass, which effectually secured the metal surface from contact with noxious gases or damp vapours. Not content with applying his incrustation to plane surfaces, the mosaic worker learnt also to adapt it to the lining of domes and vaulting, as well as to the varied forms of basso-relievo. In this country, among the Pembroke marbles at Wilton, we possess one of the few specimens known of this curious mosaic, which was at once sculpture and painting. Nor is it in such exceptional productions only that we are rich, since, in the more ordinary kinds of pictorial mosaic, in which figure subjects are combined with flowing and conventional ornament, the soil of this country has teemed with valuable relics of the Roman occupation of our island.

II. The
Latin phase.

The second variety of pictorial mosaic may be designated as *Latin*, since it long retained the marked peculiarities of

MR. DIGBY
WYATT
ON DECORA-
TION, &c.
—Descended
by tradition
from the
original
classical.Early speci-
mens at
Rome.Late speci-
mens at
Novara.

style which distinguish Latin from Byzantine art. Thus, not in the choice of objects only, but in the retention of the ruddy flesh tints, the deep brown shadows, and the stumpy figures and simple costume of the decline of Roman painting, do such mosaics as those of the fifth century at Santa Sabina, Santa Maria Maggiore, and San Paolo Fuori delle Mura, at Rome, differ from later specimens executed at the same city, if not by Greeks alone at least by a preponderance of Greeks over the direct descendants of the original classical mosaicists. M. Barbet de Jouy, of the Louvre, who has profoundly studied the subject, remarks that "the mosaics executed from the time of Constantine to the Pontificate of Nicholas I. (A.D. 858) do not possess the Byzantine character." This, though partially correct, is far too sweeping an assertion; it suffices, however, to show that the separation in classification of Latin from Byzantine style in mosaics is essential to preserve a correct idea of real, not fanciful, distinctions. The earliest Christian Latin mosaic known is that which lines the vaulting of the little baptistery of Santa Costanza, adjoining the basilica of St. Agnese, and dates from the age of Constantine. It would be extremely difficult to say which was the latest.

The more closely the matter is studied, the more evident it becomes that a distinct Latin influence in the history of art is to be traced running beside, mingling with, but never altogether losing its identity in, the great tide of progress which swept from a thousand springs and sources over the whole continent of mediæval Europe. Thus, amongst existing remains of the Middle Ages, we may point to three in particular, in which many of the Latin peculiarities of mosaic-working have been faithfully preserved to a comparatively late date: one in the north of Italy, and the other two in that district over which we may frequently recognise traces of the influence exercised by the long-flourishing Latin schools of Aix-la-Chapelle and Cologne. In the pavement of the cathedral at Novara, a work executed at intervals, probably between the beginning of the twelfth and the middle of the thirteenth centuries, we meet with a very fair reproduction of a black and white classical pavement. In various medallions are birds and allegorical figures, in some of which may be observed the coincidence which occurs between the tessellation of the Novara pavement and that of the ancient pavements of Pompeii, such as I have sought to reproduce in the Crystal Palace at Sydenham. It is probable that a somewhat similar mosaic pavement, with figures representing Rhetoric, Logic, Prudence, &c. and a zodiac, was formerly in the Church of St. Irene, at Lyons, Lyons.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Ravenna.

By the
author of
the
"History of
the
Art of
Mosaic,"
&c.

a city in the neighbourhood of which many fine classical mosaics existed which might have well served as models for this mediæval specimen of tessellation.

From observations and inquiries which I made at Ravenna in the autumn of 1865 I have every reason to believe that the ancient pavement of St. Vitale, now covered over by a second mosaic pavement at a much higher level, was both in work and subject analogous to the Lyons pavements, as well as to the one about to be noticed.

St. Omer.

By the
author of
the
"History of
the
Art of
Mosaic,"
&c.

In the year 1831 extensive excavations, fully described in the work of M. Wallett, were commenced to uncover the crypt and choir of one of the ancient churches of St. Bertin, at St. Omer. These laid bare one of the most interesting monuments of art ever exhumed in France. A reference to the engravings in M. Wallett's work will show at once the nature of the pavement, which, represented by a regular classical tessellation of black, red, yellow, and bluish grey, executed in terra-cotta, stone, granite, and marble, the zodiac surrounding a square, divided diagonally by conventional ornament and containing three medallions and a monumental slab in the several triangles so spaced out. Of these the most interesting is the monumental slab which is covered by a figure of William, son of Robert, Count of Flanders. Want of space does not permit of my dwelling in detail upon the workmanship of the medallions, which show a curious transition from the mosaic to the purely incised slab pavements; but I may be permitted to congratulate France and its archæologists upon the fact that the date of 1108 wrought round the supine figure of Prince William leaves no doubt as to the retention at that period of workmen perfectly capable of imitating in mosaic the important fragments of classical mosaic which served, so far as processes of manufacture and ornament are concerned, as models for the execution of this precious work. The third rare specimen of mediæval Latin mosaic is the slab of Frumualdus, Bishop of Arras, found in the cathedral of St. Waast, at Arras, in 1835, and now preserved in the museum of that city. Frumualdus, who died in 1183, is represented standing, and in full episcopal costume. The details are worked out, as may be observed on an inspection of the elaborate coloured plate given in Gailhabaud's "*Architecture et les Arts qui en dépendent*," in tesserae, among which are many obviously gilt. One peculiarly classical feature, the retention of which would go far to prove a Latin rather than a Byzantine tradition for this work, is to be noticed in the strong black outlining of the figure. I am not aware of the existence of any later Latin tessellation than is shown in these three examples.

Arras.

We come now to the third species, Byzantine mosaic, which includes all that was done in Greece and Asia Minor; and much that was done in Italy, from the transfer of the seat of empire in the year 399, until the Italians began to learn from the Greeks to practise the art for themselves. History tells us that Constantine took artificers to Constantinople with him skilled in all the arts of Rome; and hence we naturally find that the earliest Byzantine monuments can scarcely be distinguished from the classical; but the new soil and the old soil soon caused the same parent stock to bear very different fruits. Byzantium rose as Rome sank. No doubt a freer intercourse with the nations of the East, and more especially with Persia, soon led the Greeks to engraft enhanced brilliancy on their fading recollections of classical art; and gorgeousness in costume, in textile fabrics, in illuminated manuscripts, and in pictorial mosaic, soon usurped the foremost place, once assigned to severer sources of beautiful effect. In the pages of Hope, Lord Lindsay, Gally Knight, Von Quast, Salzenberg, and Ciampini detailed information will be found upon the productions of the Byzantine mosaic-workers. Suffice it now to say that it is in their earliest labours at Santo Sofia, at Constantinople, and in the churches of San Nazareo e Celso (the tomb of Galla Placidia,) San Vitale, and the two churches of San Apollinare di Fuori and Di Dentro, at Ravenna, that the finest models for our imitation are to be met with. Byzantine pictorial mosaic is exclusively upon gold ground; and there is ample evidence that, from the date of the commencement of the iconoclastic troubles in 742, when multitudes of Greek artists and monks were driven out by persecution to seek a precarious living in foreign countries, the staple of such work was invariably executed, and the necessary materials probably manufactured, by these itinerant mosaicists. What are to be peculiarly admired in the Byzantine interiors are the breadth of decorative effect invariably aimed at, the good proportioning of the scale of the pictures and ornaments to the distance from which they require to be viewed; the judicious use of bands, margins, and string courses to keep the compositions distinct and make them subservient to an architectural disposition; and the judgment with which they invariably accentuate or give emphasis to leading architectural features. For instance, nothing can be happier than the mode in which they almost always treated the soffits and faces of arches, and the arrêtes or salient angles of vaults. No arrangements of decorative form can be happier than such as exist in some of the cupolas

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

III. The
Byzantine
phase.

Mainly
derived
from the
east.

Finest
specimens at
Constanti-
nople.
Ravenna.

Venice.

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ON DECORA-
TION, &c.

Rome.

of St. Mark's, at Venice, of which careful sections may be found in Kreutz's elaborate work.

Next to Constantinople and Ravenna, Rome certainly offers the noblest specimens of Greek work; done, probably, to a great extent, through the "Scuola Greca" established by Pope Adrian I., A.D. 782, and attached to the church of Santa Maria, in Cosmedino. As if to reward the patronage of the Pontiff, the great mosaic of Santa Pudenziana, done in his days, is by far the best in which the Greeks appear to have played the leading part. The mosaics executed at Rome for the next three centuries, although numerous and on a grand scale, exhibit, with the exception perhaps of those of Santa Prassede, a marked falling off. In those of the apse of San Clement, carried out early in the thirteenth century, a decided revival is manifested, destined to burn brightly for a short time only, being, as it were, almost the last shooting up of the already waning flame, which had for so many centuries shed a brilliant light from the capital of the Eastern empire far and wide over the continent of Europe.

IV. The
Greco-
Italian
phase.

We now come to the fourth, or Greco-Italian, series, which are important on two accounts—firstly, because they illustrate a gradual emancipation from tradition in the limitation of subjects and action; and, secondly, because they constitute the transition which ended in the transfer of the art from one nationality peculiarly fitted to maintain technical efficiency to another not less qualified to graft pictorial excellence on mechanical precision and perfection. The first mosaics executed in Sicily—those of the Church of the Admiral and of the Capella Palatina at Palermo—bear Greek inscriptions and were wrought by Greeks; in the first exclusively, and in the second probably under the guidance, as to design, of Saracenic artists.

Finest speci-
mens in
Sicily,

For the later and far more extensive works at Monreale and Cefalu, the mixed races, protected under the Norman dominion, each contributed its quota of skill. The Duca di Serradifalco and Cicognara agree in recognising the influence exerted on Pisa by the advance made in Sicily; and, through Pisa, Sienna and Florence were unquestionably stimulated to rapid advance in art. The cathedral at Monreale offers, I believe, next to Santo Sofia, at Constantinople, and St. Mark's, at Venice, the noblest and grandest instance of a church decorated throughout with mosaic. Having drawn and studied hard in it for many a day from dawn to sunset, I can bear humble testimony to its invariable beauty under every changing condition of light and shade. Whether bathed in

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

sunshine and all alive with glowing colour, or, almost dark at closing day, retaining to the last some lingering gleam upon its gilded wall faces, its aspect is one, not of gaudiness nor gloom, but of serene and dignified magnificence. It is a subject of congratulation that these beautiful mosaics are so admirably rendered by colour-printing in the great work recently published by the Padre Gravina and the Benedictines under the auspices of the Italian Government. As in Sicily, so in Venice, the art was at first kept entirely in the hands of the Greeks, who not only worked at St. Mark's, but at Torcello and Murano as well. In the latter island they, no doubt, laid the foundation of the glass trade, previously a Constantinopolitan monopoly, so far as the more difficult branches of the manufacture were concerned. From the Murano glass houses, from the Scuola Greca, at Rome, and from a manufactory established at Palermo, as well as by direct importation from Greece, the materials were supplied with which the Greco-Italian mosaics were executed. The profits made by the itinerant Greeks in Italy, coupled with an increased demand for works of decoration consequent on the wealth accumulated by the northern Republics through trade gains, soon caused an attempt to be made by the Italians to break up the Byzantine monopoly.

and in
Venice.

The success of this attempt led to the development of the fifth species of pictorial mosaic, which I have designated "Italian monumental." It was in Florence, early in the thirteenth century, that the transfer of the monopoly was consummated. Andrea Tafi, a Florentine, having insinuated himself into the confidence of certain Greeks working on St. Mark's, at Venice, prevailed at last, as Vasari says, "Con preghi, con danari, e con promesse," on a certain Apollonius to go to Florence and work with him upon the mosaics which still line the vault in the baptistery in that city. A rival of Andrea was the even more celebrated Mino da Turrita, who, having gained an earlier, although probably less accurate, knowledge of the Greek processes, preceded Andrea in working on the baptistery. Subsequently Gaddo Gaddi was employed as an assistant on these works; and by these artists, and by their pupils, and pupils' pupils, almost all the pictorial mosaics subsequently executed in Italy were carried out. Among such may be specially noticed, as combining fine execution and decorative colour with really good art, the splendid apse linings of San Giovanni Laterano and Santa Maria Maggiore, at Rome, executed by Mino da Turrita and Gaddo Gaddi, by the latter of whom Giotto's celebrated "Navicella," at St. Peter's, was also wrought.

V. The
Italian mo-
numental
phase at
Florence,and at
Rome.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

So highly did the Italians esteem the products of Andrea's combined talent and cunning that after his death they honoured him with the following epitaph:—

Qui giace Andrea, ch'opre leggiadre e belle
Fece in tutta Toscana, ed ora e ite
A far vago le regne delle stelle.

Its Mediæ-
val,

Renaissance,

and modern
stages.

Pietro Cavallini and the Cosmati subsequently obtained reputation by their mosaic, principally at Rome, the latter working in the Gothic manner altogether. I have every reason to believe that the Greeks continued to labour at Venice long after their services were dispensed with in other cities of Italy, although after 1400 A.D. I think the work at St. Mark's to have been altogether Italian. With the uprising of the great school of fresco-painting, the employment of mosaic, a far more costly decoration, was to a great extent dispensed with, although at Pisa, Orvieto, Sienna, and Rome both styles of mural embellishments are constantly to be seen together. Their union, however, is not to be admired, owing to their unequal durability—the permanence of the colour of the one frequently making needlessly conspicuous the fading or staining of the other. The best early Renaissance monumental mosaics with which I am acquainted are those from the designs of Raphael in the Capella Chigiana, in Santa Maria del Popolo (illustrated in colour by Mr. Gruner), and the vault of a subterranean chapel in Santa Croce in Girusalemme, at Rome, the design of which is attributed to Baldassare Peruzzi. The best late Renaissance mosaics on a grand scale are unquestionably the magnificent decorations of the vast cupola and pendentives of St. Peter's—models which one would fain see rivalled, not slavishly imitated, in our great metropolitan cathedral. For the production of the Papal mosaics a *fabbrica*, or Government establishment, was founded, which has not failed, up to the present time, in providing materials and labourers equal to the repair of old and the initiation of new work, equal in all respects to, and surpassing in some, the peculiarities of each style we have hitherto noticed.

VI. The
Italian
portable
phase.

A few words will suffice to dismiss the sixth species of mosaic, which I have called "Italian portable." By this term I would convey that the basis of the variety is not so much making portable mosaics, as, from the great weight of the materials, they can never be made easily portable; but rather making reproductions, in mosaic, of pictures in oil or other media, which may be really and readily transferable from place to place. This species is, in fact, little else than a revival of the fine *opus vermiculatum* of the

ancients. It would be incorrect to say that the Greeks did not ever manufacture miniature mosaic pictures, because two fine specimens exist to my knowledge — one at Florence, and the other, of extraordinary perfection and curiosity, in the Kensington Museum; but it may be safely averred, from the great rarity of such relics, that the practice was altogether exceptional. This, indeed, is not to be wondered at, since, with the quick-drying cement ordinarily used for mosaic-work, it must have been extremely difficult to execute these almost microscopic pictures, which bring within the compass of a few square inches subjects usually worked out in as many square feet.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Miniature
specimens at
Florence:—
in South
Kensington
Museum—

This leads us to the conclusion that the ancients, for their finest mosaic pictures, must have used some retarding agent, such as honey or beer would prove, to keep their cement plastic longer than it would remain if mixed with water only.

When, however, Giovanni Baptista Callandra applied, early in the seventeenth century, a mastic in lieu of an ordinary hydrate of lime to unite the tesserae, it became comparatively easy to copy the most elaborate pictures in mosaic. By this artist was executed the beautiful reproduction of Guido's St. Michael, which, with Raphael's "Transfiguration," and Domenichino's "St. Jerome," is about the best of all the celebrated mosaic pictures in St. Peter's.

and on a
larger scale
at Rome.

In the marble incrustation which forms our seventh species, and which is best known as Florentine mosaic, the tints and shades are given by the natural colours of the jasper, agates, and other precious materials of which the work is composed. The hardest minerals only are used; and, as each small piece must be cut and ground to a pattern, and each thin veneer backed by a thicker one of slate, or some such material, in order to give it strength, so much labour and time are involved in the production of this kind of mosaic that its high price has necessarily limited its use. Zobi, the principal writer on the art of *pietra dura* mosaic, tells us that he knows of "no existing example in Italy of marble pictorial mosaic executed during the first periods of the revival of the arts, except the specimen to be seen in the central nave of Sienna Cathedral, said to be the work of Duccio di Buoninsegna, who lived in the fourteenth century."

VII. Mosaic
in "pietre
dure."

There can be no doubt, however, that the art was founded on the *opus sectile* of the ancients, and that it descended by regular tradition from classical times. I need scarcely recall to your recollection the extraordinary advance made in the pavement of the same cathedral upon the work of Buoninsegna, by that great master of the sixteenth century, Beccafumi. The art was lavishly patronized by the Medici. The

Founded on
the "opus
sectile" of
the ancients.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Under the
Medici.

In the East.

The first
six phases
pictorial
by aggrega-
tion of
uniformly
coloured
parts.

In the
seventh
nature
paints as
well.

The present
eclectic
revival.

In Italy.

celebrated Fabbrica Ducale of Florence was founded by Ferdinand I., Grand Duke of Tuscany, in 1558; and its reputation during the seventeenth century was kept up by the exertions of those artists to whom Florence owes the finest specimens of mosaic which enrich her palaces and galleries, and whose names are for the most part given to us by Baldinucci. Before taking leave of this subject we must not omit to notice the exquisite specimens produced in India of pictorial mosaics, representing the finest arabesque and conventional ornament in *pietra dura*. That the Indians were early in possession of all the technical ability necessary for such work is proved by the antiquity of some of their gem-cuttings, inlaying, polishing, and carvings in hard stones; but it is probable that their Sovereigns owed much to Italy for assistance in that beautiful arabesque-work which ornaments the great monuments at Delhi and Agra; for in 1688 a passport was obtained from the King of Spain, by the Grand Duke of Tuscany, for four workmen skilled in mosaic working in precious stones, whom he was about to dispatch to the Great Mogul.

Such being the whole of the varieties of mosaic which have heretofore prevailed, it behoves us to see in what relation the present stands to the past. To facilitate the student's just exhaustion of the problem, it will be well for him to group as one the first six varieties, and to consider the seventh separately, their being this fundamental difference between the first six and the seventh—that whereas in every one of the first six the whole of the pictorial effect is dependent on the aggregation of coloured particles, each particle being of a uniform, even colour; in the seventh, nature supplies variously coloured and tinted substances of extraordinary hardness and durability, which the mosaicist selects and shapes so as to represent the various lights and shades and local colours, not in an even intensity only, but in all the gradations and variations which characterise the objects he endeavours to portray minutely. The style of modern mosaic decoration may in general terms be designated as an eclectic revival of all the styles of the past, and we shall now briefly take stock of the condition of the art as at present practised by the principal nations of Europe, and as illustrated by the products of the International Exhibition.

As great parent of the art, it is but just to Italy to give her precedence. Fortunately, the tendency of the Roman Catholic Church has been eminently conservative; and to her honourable desire to uphold and repair her “ancient fanes” we are indebted for the preservation of the tradi-

tions and practice of mosaic making and working upon a grand scale. Attached to three of her principal shrines have long been schools where the mosaic-worker has been reared and employed, at the charge of the State or Church, to repair the splendid mosaics of St. Mark's, at Venice, San Benedetto, at Monreale, in Sicily; and St. Peter's and other sublime structures at Rome. These State establishments are not directly represented in the present Exhibition, but their influence is perceptible even in their absence. It is a hopeful sign for Italy that what was long a hothouse plant only is now showing itself as "a hardy annual," and private enterprise is carving out for itself an honourable path scarcely to be trodden by any Governmental institution. To Signor Salviati, of Venice, the great honour will always accrue of having given this vigorous impulse to a branch of industry which seemed to be dying out from inanition in his native city. It is always satisfactory to find such efforts as those which Signor Salviati has made duly appreciated, and it is pleasant to read the terms in which they were spoken of by the Royal Commission of members of the Venetian Academy of Fine Arts appointed in 1861 to examine and report to Government upon Signor Salviati's establishment. They report* that they "found that the drawings executed by " Signor Salviati's order, and serving as guides in the " manufacture of the mosaics and of the intaglios of his " establishment revealed the best possible taste, being well " and artistically done. They have no suggestions to offer " as to their improvement, and they cherish the conviction " that a man who has already sacrificed personal interests, " tranquillity, and time; who has abandoned a liberal pro- " fession securing to him a distinguished and honoured " position in the country; who spends large sums of money " and makes long journeys for the sake of introducing im- " provements; who, unassisted, and not in the possession of " a very large capital, has founded an establishment increasing " every day in importance, and who gives bread and work to " so many artisans, requires no additional stimulus to spur " him on in his task. His own intelligence, his own dis- " interestedness, and the love and the care which he has " devoted to this new undertaking, are the best guarantees " for his future improvement and for his continual pro- " gress."

This "continual progress" Salviati has well maintained up to the present time, as is abundantly testified both by his

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WYATT
ON DECORA-
TION, &c.

At Venice.

Monreale.

Rome.

By Salviati.

His great
merits and
success.

* "Di un nuovo stabilimento patrio di mosaici, &c., relazione di B. Cecchetti. Venezia, 1861."

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

works executed in this country and by his samples shown in the French Exhibition, which are in every style, from the close imitation of nature in works such as his portrait of Prince Albert, to the regular conventionalities of the Greek saints, reproduced from models in St. Mark's. I shall have occasion to return to Signor Salviati's labours in speaking of the progress of pictorial mosaics as an element of decoration in England. One of Salviati's great merits has consisted in his generous appreciation of the talents and experience of old Lorenzo Radi, the glass-worker of Murano, in whose person the traditional mysteries of "smalto" making, partially revealed to us by Neri,* seemed concentrated, and on the point of perishing with the old man's death. Now, fortunately, through Radi's nephew, Giovanni Albertini, and Salviati these processes are fully preserved, improved upon, and worked (as I had occasion to observe in a recent visit to Murano) upon a really great commercial scale.

While Venice is thus flourishing in a revival of this good old art, Rome is showing some signs of life in the extension of what is commonly known as Roman mosaic (*i.e.*, a reproduction of the *opus vermiculatum* of the ancients), from paper weights and table tops, to which its application (with the exceptions to my knowledge only of some very good pilasters in the villa Borghese and some few attempts in the villa Torloniana at Rome) has hitherto been limited to chimney-pieces and similar portions of domestic structures. In the exhibition of the Papal States this year there is shown a very pretty marble chimney-piece decorated with these mosaics from designs by E. Salandri, of London, who has lately shown me several clever "projects" for similar works, which he is anxious to import into this country.

Through
Salandri.

At St.
Peters-
burgh.

As an important offshoot from Rome we have next to consider an establishment which, but for its being "Imperial," and therefore "hors concours," would unquestionably have received the highest honours any jury could have conferred. I allude to the Imperial glassworks of St. Petersburg, under the especial patronage of Prince Garkarin, and presided over by Signor Bonafede, the favourite pupil of the celebrated Chevalier Barbetti, the mosaicist, of Rome. What the French would call a splendid "gamme" of coloured "smalti" for the execution of mosaics exhibited by this establishment in 1862 received the warmest commendation from the jury, of which I was a member on that occasion, and was subsequently presented to the Department of Science and Art by the Emperor of Russia. The present Exhibition shows

* "De Arte Vitriarâ."

advance rather than falling off, and unquestionably the best pictorial mosaic of all in the building is a colossal one, executed with "smalti" from this establishment, by F. Bouroukin, M. Mouraviev, and G. Agavonov, from a picture by Professor Neff. It represents a group of saints, and for breadth of effect and simplicity of execution leaves nothing to be desired. It is intended to form a portion of the internal decoration of the great Protestant church of St. Peter, at St. Petersburg, a structure of great size, the general design of which is creditable to its architect, C. Tatzky. This mosaic is essentially pictorial in its freedom from conventional restraints of any kind, and is so beautiful as to form, to my mind, a perfect model of what a pictorial mosaic adapted for harmonising with architecture of the nineteenth century should be.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Through
Bonafede,
Neff, Boura-
kin, and
others.

In France there are no great signs of life in the revival of the art of pictorial mosaic. It is true that in the year X. of the Republic the authorities founded an establishment in rivalry with the "Fabrica Papale," under the charge of a Signor Belloni, for teaching French workmen to make mosaics, "all' uso di Roma," but it never flourished; and, whether in the original establishment, the old college of Navarre, in the Rue de la Montagne, St. Germain, or in the Rue des Cordeliers, to which Belloni ultimately removed, little was done, and the manufacture was never other than a short-lived exotic. Sèvres this year shows a few specimens of revived ecclesiastical pictorial mosaic, which suffice to show, what nobody in his senses would doubt, that the French could make excellent mosaics if they were so minded; but at present it is clear that the architects have neither taken it up nor have the public demanded it as a decorative adjunct for churches or domestic structures, as we have already begun to do. A Commission has, however, recently been given to Salviati to execute a series of medallions, representing tragic and comic masks, &c., for the decoration of the new grand opera house at Paris. These I have seen in progress at Venice, and admirable they certainly are.

In France.

This brings us to England, where matters now stand in a most hopeful position; and it may be well to trace a few of the steps by which that hopeful state has been attained.

In England.

The revival of mosaic in this country as an architectural adjunct may be considered to have begun in 1839-40, about which time Mr. Blashfield endeavoured to produce decorative pavements by means of inlaid asphalte, coloured cement, and Venetian pisé works, aided by the clever inventions of Mr. Singer, of Vauxhall; by his ingenious assistant,

Its early
stages,

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Mr. Pether ; and also by Mr. Prosser's mode of producing a tile of great density and closeness of texture, by subjecting powdered China clay to strong mechanical pressure in iron moulds, and in this way obviating the shrinking caused by evaporation which is unavoidable when the clay is used in a moist state. Mr. Prosser's invention was first applied to the manufacture of buttons, in which for some time a large trade was carried on. Recently Messrs. Maw have invented a process by which they obtain tesserae with the close texture and consequent hard surface only to be obtained by aqueous shrinkage, and hitherto only approached by subjecting the materials to extraordinary pressure. The best specimen extant of Mr. Singer's work is the pavement of the hall of the Reform Club.

through
Minton.

Owen Jones.

Mr. Minton, I believe, at the suggestion of Mr. Blashfield, turned his attention to the application of Mr. Prosser's patents to the production of tesserae suitable for the formation of pavements similar to those of the ancients. Many beautiful geometrical combinations for this purpose were suggested by Mr. Owen Jones, and the result of Mr. Minton's spirited efforts was the speedy introduction to the market of excellent tesserae in all colours.

Blashfield.

In 1844, when I went abroad to study my profession, Mr. Blashfield gave me a commission to obtain for him anything which I considered likely to render these tesserae (the manufacture of which Mr. Minton had then just entered upon) of more general utility. In Italy and Sicily I found much material, of which I believed little notice had at that time been taken ; and this induced me to make a series of drawings, which I afterwards published in "The Geometrical Mosaics of the Middle Ages." These drawings were shown to Mr. Minton by Mr. Blashfield ; and on my return to England, in 1847, Mr. Minton applied to me to assist him in his views with respect to encaustic tiles, and their combination with tessellated work in general. For some time I rendered him what aid I could, and, but for other and more pressing professional engagements, I should probably have continued to do so. On Mr. Minton's retirement from active business, Messrs. Maw & Co., determining to add the execution of mosaic to their encaustic tile manufacture, sought my co-operation, which has been given, at such intervals as have suited our mutual convenience, up to the present time. Feeling their strength quite equal to the production of pictorial as well as geometrical mosaic, Messrs. Maw requested me, on the announcement of the intended Exhibition of 1862, to design a pavement of that character for them. This I did to the best of my ability ; and the

Maw.

work, which included large heads of the four seasons in conventional framework, was exhibited and favourably received by the public. It is now to be seen in the South Kensington Museum, where, as the first completed specimen upon any considerable scale of a pictorial mosaic executed in England, it is not without interest. Whatever its defects may be as compared with later works, there is no doubt that by its execution its manufacturers fully proved their capability to rival any antique mosaic yet exhumed in this country. To have attempted successfully such an experiment, involving the production of an indefinite number of tesserae of about 100 different tints, many never previously got up in England, and the application of skilled labour as it had never before, I believe, been employed in this country since the last Roman quitted it, was, I do not hesitate to say, highly honourable to them as manufacturers; and it is a source of gratification to me to have been associated with them in this, the first, practical endeavour to revive pictorial mosaic amongst us. Concurrently with Messrs. Maw, other manufacturers began to turn their attention to the production of materials for the execution of mosaic; and Messrs. Powell & Co., of Whitefriars, Messrs. Minton, and Messrs. Jesse Rust & Co., instituted exceedingly interesting and successful experiments. Messrs. Simpson & Sons, the London agents to Messrs. Maw, also experimented upon the operations of cutting, making up, and backing, &c.; while Signor Salviati, who had been invited by Mr. Penrose to aid him in the projected mosaics for the pendentives, &c., of the dome of St. Paul's, was led to seek employment in this country, which he has readily found, and to a great and, I trust, remunerative extent.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Powell.

Rust, &c.

Simpson.

The officials of South Kensington took up the matter from an educational as well as from a practical point of view; and attempts have been successfully made in their schools to instruct female students in the practical execution of mosaics from cartoons made by masters in the school and eminent artists who were employed by the department to make cartoons upon an extensive scale—in the first place, for filling up the great series of recesses along the Cromwell-road front of the picture galleries of the International Exhibition of 1862; and, in the second, for the numerous panels on the upper level of the interior walls of the museum of the department. The first of these projects failed, mainly from the unfavourable reception the buildings in question received from the public; but the second is in process of realisation, and the present Exhibition contains two full-size figures which will take the place (after the close of the

Works at
South Ken-
sington.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

As shown in
the present
Exhibition.

Exhibition) of the models from which they have been taken, and which occupy temporarily the niches the mosaics will ultimately fill. The panels in question represent respectively Phidias and Fra Angelico. The former has been translated into mosaic by Messrs. Powell & Co., from a painting by Mr. Poynter; and the latter by Messrs. Minton, after a picture by Mr. Cope. Having had an opportunity before the mosaics were sent to Paris of comparing them with the originals, I can attest the perfect success of the transcription, both in form and colour. Mr. Cole, of the Department of Science and Art, as an old and intimate friend and helper of Herbert Minton, has, to my personal knowledge, incessantly stimulated all concerned in bringing forward this elegant and permanent decoration, and has with zealous care brought together, and displayed in the section of the South Kensington Museum devoted to architecture and building contrivances, everything calculated to assist the student who would desire to make himself acquainted with the materials available in the present, and the best models of the past.

Employ-
ment of
Salviati in
England.

It is satisfactory to be able to feel that Salviati's best works have been executed from designs and cartoons by English artists. The works he has executed for her Majesty at St. George's Chapel, Windsor, for St. Paul's, London, and for Westminster Abbey, are all in this category; and Messrs. Clayton and Bell's cartoon for the reredos of the last-named building was highly commended and rewarded by my jury. It is scarcely necessary to add that Salviati was also justly and fully appreciated by the jury, as were the honourable exertions of South Kensington.

Suggestions
as to re-
vivals.

Such being the actual condition of the manufacture at the present moment, I think it will be admitted that it is really incumbent on the studious architect (and in a minor degree on the art-loving public) to endeavour to grasp the theory of the right application of pictorial mosaic; and it is in the endeavour to aid him and them by my experience that I venture to reproduce a few convictions on the subject, at which I arrived some time ago, and in which I am confirmed by all I have seen in the present Exhibition.

The theory
of mosaics.

The combined action of the moisture and severe frost of any northern climate is such as must always, I fear, render but little durable any extensive application of mosaic in small tesserae as external decorations. To a great extent, therefore, architects will have to look upon it as an internal, or at any rate, a protected embellishment. It is, of course, a coloured incrustation applicable to any structural surfaces which it may be desirable to enrich; and its appropriate

design may be strictly determined by very nearly the same laws which should govern the distribution of polychromatic decoration, executed through any other medium upon similar surfaces. The rationale of these laws has been by no one better illustrated than by Sir Charles Eastlake in his invaluable reports to the Fine-Art Commission; and it is better that I should refer to what he has so well written in those documents, than attempt to give now any paraphrase of them. The chief exceptional conditions are, firstly, the expense of mosaic, which entails simplicity; secondly, the extremely vivid way in which it reflects light and exhibits local colour partially, demanding judgment to adapt the design to the mode of lighting; and thirdly, its limitations, under ordinary circumstances, as a means of artistic expression, which lead to the prudent avoidance or sparing employment of many of those pictorial elements, such as perspective, foreshortening, lively action, or complicated chiaroscuro, which are proper and agreeable sources of effect in mural paintings executed with more tractable vehicles. That which the designer will probably at first feel to be his greatest difficulty, the arrangement of the cement joints which attach the tesserae to one another, will, when once he has mastered the principles upon which they should be disposed, prove a ready and most essential means of heightening his effects. The jointing is to a mosaic designer exactly what the lines and reticulations of an engraving or etching are to an engraver: and the rules of taste which apply to the one apply equally to the other. For instance, as the engraver's lines, by convexity or concavity, express the undulations of drapery and the modelling of surfaces advancing to, or retreating from, or above or below the spectator's eye, so precisely should the directions of the jointing of a piece of pictorial mosaic. Again, as the regular ruling or cross-hatching of an engraved half-tint is made to give value to the broken lights and shades of the leading figures, to which, by their vivid contrasts, attention has to be attracted, so should the uniformity of the jointing with even-sized tesserae diminish the brilliancy of a mosaic background, breaking up the light which would otherwise be so strongly reflected from, say, a white or golden background, as to quite kill the effect of the figures or ornaments to be relieved upon it. Another point which should be carefully attended to in arranging the jointing is to allow a row of tesserae of the same colour as the ground to always follow every leading contour profiled upon the background. The use of this rule, which was invariably followed by all good mosaicists, is to prevent the directions of the generally horizontal and vertical

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Its limita-
tions.

Its scope.

Jointing.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Need of
really good
artists for
cartoons.

jointing lines of the background from cutting awkwardly against the profiles, which the eye should be allowed to follow without being led off into other channels or distracted by the occurrence of irregularly-shaped tesserae next to leading forms. This re-duplication, as it were, of mosaic outline, has almost the effect of the lead-line in stained glass, and is not much less essential to good effect. It is highly gratifying to observe the degree of judgment with which the mosaicist has emphasised the designer's intention by a judicious treatment of the jointing in the Russian, Salviati's, and the South Kensington specimens now exhibited. It is always to be remembered that at the distance from the eye at which mosaics are usually likely to be placed mechanical defects disappear, but that artistic mistakes betray themselves, despite the most perfect mechanical execution. Hence it is far better to spend time, thought, and money in getting really first-rate cartoons than in endeavouring to bring the tesserae to fine joints or microscopic minuteness. In mounting to the summit of the great dome of St. Peter's glimpses are caught from time to time of the nature of the mosaic work; and the observer who, from below, may have fancied the whole to have been wrought with great exactness, will find that the work is of the coarsest description, with joints in which often a good sized pencil might be laid. Owing to its judicious design, however, the effect of the whole is eminently satisfactory when viewed from the floor of the cathedral.

It may be well to remember also that although mosaic is, as it were, painting, it is something more in its relation to the structure it decorates—it has become “bone of its bone;” and, in virtue of its intimate and permanent union, is especially bound to live in peace and harmony. As a good wife should make conspicuous the virtues of the husband she adorns, should enhance his virtues, and screen his defects, so should a well-devised system of mosaic give, by predominant vertical lines, height to a structure in which height is wanting; and, by predominant horizontal lines, length where length is needed. Brilliancy may be wrought out of darkness by allowing gold grounds and luminous colours to prevail: while the eye in another building, “faint with excess of light,” may be refreshed by a preponderance of cool, deep, and quiet tones. Stringcourses and borders, archivolts and imposts, bands and friezes, should be treated as permanent frames to permanent pictures, essential, by their rectangularity or other simple geometrical character, to afford the eye a ready means of testing all adjoining and more complex forms by contrast. Need I say that where the skeleton of the picture's composition is tossed

Principles
on which it
should be
designed.

about in lively action a stronger boundary of more vivid and contrasted hues must inclose it as a corrective than when the motive power of the picture is of a quieter and simpler structure? That is the reason why the great Venetian pictures demand such massive framing, while the more serene compositions of the early Florentine and Siennese schools look best when separated one from another by little else than narrow bands of flat and softly-tinted ornaments. In the same way in mosaic the rigid saints of the early Byzantine school, with their evenly-balanced limbs and perpendicular draperies, need little else than vertical palm-trees, or inscriptions, or upright staves placed between them, to keep them architectonic; while the later corresponding figures of the Italian school, with their swaying lines, require often actual insertion into recesses to keep them even reasonably quiet.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Such are a few of the most important theoretical points which have occurred to me, but there are other and more abstruse details to be mastered before perfect success can be achieved, but upon these I cannot with propriety enter in this report. Such are those which arise out of the different artistic conventions which form graduated stages between the crudest mode of, as it were, symbolising nature and the most highly-perfected form of imitative art. While an intimate acquaintance with the specific conditions of each of these stages—which are to the designer what keys are to the musical composer—will be a great assistance to the mosaicist, an ignorance of or an indifference to them will lead him into great trouble and confusion.

Necessity
for special
study of
“conven-
tions.”

With respect to specific style as affecting pictorial mosaic a few words remain to be added. We have seen that, as a decorative art applicable to monumental structures, it has survived every fluctuation and vicissitude which have affected architecture from the Christian epoch to our own time; as certainly will it outlive the little differences which split our architects up into Goths and Greeks—“big-and-little-endians” of the professional golden eggs. We have begun now to introduce a new element into our national art, and, happily, one which may, with precedent, and therefore with a good conscience by those who lean heavily on precedent, be used alike in buildings of whatever historic style we may any of us peculiarly affect. Let me, then, express a hope that it may not be considered necessary to retain the defects and mannerism either of too much or too little academic knowledge peculiar to ancient, mediæval, or modern times, but that we may rather concur in doing the very best we any of us can with this art without pedantry or a slavish deference to the past. The whole history of monumental and indus-

Adaptation
to specific
styles.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

trial art has shown us that never is perfection attained in any product in which the material conditions and the processes by which those conditions may be best enhanced and developed, have not formed the basis of the theory of construction, manufacture, or application of any such product. This has held good of glass, stone, wood, marble, and of all the metals ; and assured am I that, if we are to make this art of pictorial mosaic a credit to the nineteenth century, a similarly "objective" spirit must also direct and determine the specific mode in which, under every varying condition of style and historical association of ideas, we would endeavour to rival the great masters of old in their use of this time-honoured embellishment.

Revivals of
"pietra
dura"
mosaic in
Italy.

Before leaving altogether the subject of mosaic, it remains only to notice very briefly the other section of the art, in which Nature is herself made to turn painter to help the mosaicist to his effects. In this style the Exhibition includes not many competitors of importance. The chief are M. de Triqueti, the Royal (formerly grand ducal) manufactory of mosaic in *pietre dure*, of Florence ; the Imperial establishment for work of a somewhat similar kind at Peterhof, Russia ; Betti, Barzanti, and Rinaldelli, of Florence ; and the Englishman Birley, of Ashford, in Derbyshire.

England.
France.
England.

M. de Triqueti, the well-known sculptor, author of the "Marmor Homericum," Mr. Grote's gift to the London University College, displays in the section of fine arts four large panels in what he calls "Tarsia de Marbre." In some respects this assimilates to the well-known pavement of the cathedral at Sienna, and forms, in fact, pictures in which local colour is represented by slabs of variously-tinted marbles, and form, by hatchings filled in with black or other coloured cements. The process admits obviously of a highly-conventionalised treatment of subject only. The effect produced is novel, and, owing to the great merit of the artist, interesting ; but, to my taste, the mechanical difficulties to be overcome are too great to permit of adequate pictorial representation. What is given is either too much or too little for what is wanting, and there is an inadequate balance between the expression of colour and that of form. This insufficiency is scarcely felt when such a process is applied on a small scale to the elaboration of conventional ornament, or even of arabesque, introducing figures, &c., as it was occasionally in monuments and commemorative tablets by the sculptors of the early Italian Renaissance ; but in highly-dramatic themes, portrayed in life size, the picture in its perfect gradations, if not in full intensity, of light, and shade, and colour, is so essential to convey expression to the mind of the spectator,

M. de Tri-
queti's fine
works.

and to enable him, as it were, to identify himself with the scene, that no resource of the painter's art can be spared. To produce pictorial effect in "tarsia de marbre" appears to me so difficult as to make one say, with the well-known epigrammist, "would it were impossible." In this particular instance M. de Triqueti has shown himself at all points the accomplished artist he is well known to be; and if he fails by such a process to charm who is likely to succeed? at any rate in works of so ambitious a character.

M. de Triqueti's great mosaics (for mosaics they undoubtedly are) consist of four very large plâques or tablets with accompanying pilasters, and will form part of the wall lining of the Wolsey Chapel at Windsor, dedicated to the memory of Prince Albert by Her Majesty the Queen, serving as complements to the splendid gold-ground mosaics by Salviati, specimens of which are to be seen in the Italian department. They represent respectively—1, Moses blessing the people of Israel, the approach of his death, and his delivery of the Pentateuch to the Levites; 2, David composing his psalms under the divine "afflatus;" 3, Daniel in the lions' den; 4, Nathaniel under the fig-tree. The subjects of the pilasters are analogous.

For the
Wolsey
Chapel,
Windsor.

Thus it will be seen that their aim is the loftiest possible; and it is but just to say that, in dignity of style, the design and execution are irreproachable. My criticism is directed, not against the artist or his work, but solely against the method as available for the expression of such subjects. For fear that on so important a work my views should appear prejudiced or unjust, it is but fair to let the author describe the process in his own words:—

Their aim.

"These bas-reliefs," he states, "have been executed by
"an entirely new process, and the ornamental framework
"which surrounds them is no less novel. They are composed
"of different marbles planted on a base also of marble. The
"drawing and modelling of the figures are given by deep
"incisions, which are filled up with a coloured cement which
"adheres perfectly to the marble, with which it is of equal
"hardness — so equal, indeed, that the same process of
"polishing is applicable to both. The colours employed in
"tinting the cements are, from their very nature, permanent.
"The whole is thus calculated to last, without change, until
"destroyed by accident or wilful intent. Its inventor
"proposes to designate this new branch of art 'tarsia de
" 'marbre,' as reproducing in its general aspect the Italian
" 'tarsias' ('intarsiature'), executed in wood in the four-
"teenth and fifteenth centuries, although the new style
"differs from the well-known old one in the materials and

Their pro-
cess.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

“ process of manufacture, as well as in the results obtained.
“ It also differs from the works in the cathedral at Sienna,
“ the pavement of which is executed with the aid of similar
“ incisions, filled in with a black resinous mastic, the use of
“ which was speedily abandoned on account of its want of
“ durability. It is also without local colour, and has never
“ been employed for mural decoration. The cutting out of
“ the ornaments in marbles of different colours which compose
“ the borders has never been previously attempted on a large
“ scale for want of any mechanical contrivance which could
“ bring down the price of such work sufficiently to justify
“ its use for the decoration of great buildings. The borders
“ now exhibited show that this problem has been resolved
“ from henceforward. Corresponding work executed at
“ Florence on the old system has hitherto cost enormous
“ sums, and its use has for that reason been so restricted as
“ to scarcely exist in any but the most exceptional cases.”

Works from
the Royal
manufac-
tories at
Florence.

Although there is room for many observations on this manifesto, this is scarcely the place to enter upon them; I would simply point out the works as well repaying careful study. I pass therefore to a consideration of the products of the Royal, formerly grand ducal, *fabbrica* of mosaic in *pietre dure* at Florence. So far as mechanical execution is concerned, the old perfection is maintained in what is now shown; but the labour is to the art as a mountain to a molehill. Its chief specimens in the present Exhibition consist of a landscape representing the tomb of Cecilia Metella, at Rome, a picture of the Last Supper, a statuette of Dante, in which the draperies, &c. are all represented in natural colours cut out in the very hardest stones (gems, in fact) possible. In all these the jury regretted that the original models were not worthy of the infinite skill, patience, ingenuity, and great outlay necessary to the elaboration of the finished products.

At St.
Peters-
burgh.

In comparing these samples with those forwarded from the Russian imperial establishment of Peterhof, it was felt that the artistic direction of the latter exhibited a juster apprehension of the legitimate capabilities of mosaic “*en pierres dures*.” Although, perhaps, a little overdone with gilded mountings, the splendid “*Armoires*,” inlaid with the choicest lapis lazuli and with raised fruits and flowers, did great credit to M. Jafimovitch, the director of the manufactory. In close examination of the precious materials in which these mosaics were executed, one could not fail to be struck with the beautiful subdued pink tint of the rhodonite, a colour unattainable, so far as I know, in any other substance. The selection of specimens of lapis lazuli fringed with white vein-

ing to represent the petals of some panzies, constituted a "luxe" beyond a "luxe" in this princely "vanity." On a larger scale, the working of some of these precious materials (jaspers and rhodonite) at the Imperial establishment at Ekaterinbourg received the warmest admiration from the jury, both on account of the elegance of the forms and the splendid size and purity of the samples of rare and most costly minerals.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

At Ekater-
inbourg.

If one cannot but trace some falling off in the good taste which should preside over such an establishment as that of the Royal Florentine manufactory of mosaic in *pietre dure*, it is gratifying to have occasion to observe that this decadence has in nowise extended to the independent producers of a somewhat similar class of goods in Florence. Many very good samples of the usual imitations of flowers, &c., inlaid in black marble for table tops and cabinets, are contributed by various Florentine manufacturers, amongst whom the jury specially noted the houses of Barzanti, Betti, and Rinaldini. In the same class of goods the table top exhibited by our solitary producer in the same line, Mr. Samuel Birley, of Ashford, Derbyshire, was much admired. Observations were, however, made upon the inequality of scale in which the centre group of flowers and the surrounding wreath had been worked out.

From
Florence
generally.

By Birley of
England.

Before passing in this report to other special miscellaneous branches of "decorative work," it may be well to notice an institution, the golden fruits of which are sufficiently manifest throughout the British section, and which are, in fact, of no mean importance, not only as making up the present goodly show, but as pregnant with promise for the future of British industrial art.

Special
exhibits
in many
classes of
decoration

There is probably no exhibitor in the whole building whose contributions are so difficult to classify as are those which appear collectively under the name of the Department of Science and Art, South Kensington. The various items so appearing correspond not ill with the all-embracing title of the department, and one is somewhat at a loss to determine whether they are most interesting under their utilitarian and scientific, or their artistic aspect. When they were first brought under the notice of the juries of classes 14 and 15, supposed to take cognisance, respectively, of furniture and decoration, but which actually worked together, as I have before said, as one jury, an inclination was felt to remit each item or sets of items to other classes, to which they appeared to refer specially—as certain specimens of terra-cotta work, to the jury for ceramics; certain other terra-cotta work, the bronze door, &c. to civil engineering and building con-

by the De-
partment of
Science and
Art.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Which was
excluded
from re-
ward.

Its general
influence as
teacher.

Works pro-
duced under
its auspices.

trivances; and the mosaics to the class for vitreous manufac-
tures, or, possibly, to the last named but one. On reflection,
however, there appeared to be running through them all so
manifest a decorative "strain" and intention that it was felt
that that intention demanded distinct recognition on our
parts; and, if it failed to receive it from us, we did not see
that it would be likely to receive its due commendation
under its general aspect from the jury of any other class. It
was, accordingly, determined to recommend the department
for a gold medal, which would indubitably have been
conferred, had it not been determined to place all exhibits
proceeding from manufactories or departments supported by
national funds out of the competition altogether. This
exclusion from reward in nowise nullifies or abates merit,
and leaves the duty still upon the reporter of justifying the
favourable opinion entertained and expressed by the jury.
In the case of what (for brevity) we may designate as South
Kensington, the first debt of gratitude, on the part of all
lovers of art, was felt to the institution from an educational
point of view. Its influence, directly and indirectly, as a
teacher was felt to pervade the decorative aspect of the whole
of the British section. The first result of such teaching, the
multiplication of draughtsmen, or, at any rate, of persons
capable of understanding the various graphic processes alone,
has gone far to supply what, ten years ago even, was a
"crying" deficiency in England. The operation of the
central and often itinerant museums, in which the artist, the
workman, and the general public may freely examine and
draw from the choicest examples of the industry of the past,
has proved at least equally beneficial. The organization of
the system of reproduction of the best models by the cheapest
possible plaster casts, photographs, galvano-plastic processes,
chromo and photo lithography (of which a charming series of
specimens was exhibited on the present occasion) has
extended the benefits of the museum to the very homes and
workshops of the student. This system has been much
appreciated on the Continent; and in the Austrian and other
departments signs may be recognised of the inauguration of
similar systems, leading, no doubt, to an international
exchange of good models, calculated to advance the general
interests of art and industry in the highest degree.

Setting aside, for the present the question of the extent
to which it may be good policy for a State to produce works
of art on its own account simply to serve as models for
imitation by private enterprise, there can be no doubt that to
take advantage of the necessity for the construction of
adequate galleries and buildings for the department to give

an impetus by State aid to the national arts of construction is both justifiable and laudable. It is in this direction, apparently, that the officers of the department have been labouring zealously and with a good measure of success. In speaking of terra-cotta, faience, enamel, and mosaics, I have already taken occasion to allude to the success of the department's exhibits, and I think there remains only to notice specially the fine bronze door (destined to form the entrance-door to the museum), which will long bear its testimony to the rare talents of poor Godfrey Sykes. Had it pleased God to endow him with a frame as robust as his imagination was fertile and his hand well trained, he would, I cannot doubt, have originated a series of monuments of art-industry which would have been treasured at home and would have done us infinite credit abroad. The doors in question constitute a fine and original work, presenting us with a series of figures in high relief of the worthies of art-industry, each standing in a somewhat severe architectural framework. They have been skilfully carried out in the galvano-plastic or electrototype process by Franchi of London (in whose name they are exhibited), from the general design left by Godfrey Sykes, and executed after his death by his assistants, John Gamble and Reuben Townroe.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

We (and indeed it is a prevalent bad habit in most countries) are too apt to speak and think generically of things we understand imperfectly, forgetting that endless variety may exist in each genus, and "we not know it." Thus, we speak of any monumental crosses as "Eleanor crosses," whereas Eleanor crosses are but varieties in a genus. So many will speak and think only of Mr. Sykes' production as a "Ghiberti door," while, in fact, the two will have nothing whatever in common except the facts that both are doors and both are made in metal. The design is different *to-to-cælo*; the process of fabrication is different, the style is different; and one might as justly accuse Ghiberti of plagiarism because his bronze doors followed and rivalled that of Andrea Pisano, as accuse Mr. Sykes of want of individuality because Ghiberti and many others had preceded him in the same road. The truth being, that Mr. Sykes' work was really produced in emulation of the beautiful, but unfortunately incomplete, designs for a "monumental door" made some 20 years ago by his old friend and master in decorative art, Alfred Stevens. Anyhow, the door in question will be the first of its kind in England, so that South Kensington may be congratulated upon obtaining novelty as well as beauty in this specimen.

Godfrey
Sykes'
bronze door.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

General up-
holstery in
France.

England.

Switzerland.

Belgium.

Prussia.

Hesse.

Furniture
in precious
stones and
materials.

Algerian
onyx.

I pass now to various miscellaneous sections comprised in Class 15, reserving for a finale some general observations upon "furniture, ornaments, and decorations for the services of the Church."

In general upholstery, including "bed furniture, stuffed chairs, canopies, curtains, tapestry, and other hangings," the present Exhibition contains in no department any great quantity of novelty. Much which was commended by the jury of 1862 is equally commendable now; but it would be needless repetition to dwell long upon what is good, but generally perfectly well known—such, in France, as the "sommiers Tuckers;" the excellent upholstery of Bruseaux and Co., and of Mdme. Veuve Brag, the hangings of Mathevon Bouvard, of Lyons, the chairs of Jeanselme, the marqueteries of Marcelin, the porcelain inlay of Rivart, the portable iron furniture of Tronchon, the stamped leather of Dulud, and ornamental leadwork of Monduit and Bechet; such, in England, as the beds and bedding of Heal and Co., the chairs of Ingledew, the brass bedsteads of Winfield, of Birmingham, the picture-frames of Rowley, of Manchester, the slateworks of Magnus, the japanning of Bettridge, the stained pine bed-room fittings of Dyer and Watts, and the curtains of J. and J. S. Templeton, of Glasgow; such in Switzerland, as the parquets of Wirth and Muller Bridell; such, in Austria, as the bent wood furniture of Thonét; such, in Belgium, as the chimney-pieces of Leclercq and Mellot, and the parqueterie of Tasson and Dekyn: in Prussia, as the frames of Voeltykow and Bürges, and the parquets of Peters and Klemm; or in Hesse, as the parquets of Nussmann and Bimbét. Of all such houses and products it may suffice to say, that all exhibit in excellent form the current goods, the perfect qualities of which have established the reputations of those firms for what they manufacture.

Foremost amongst the makers of objects of furniture in precious stones and materials, other than those already noticed, should certainly be placed the "Société des Marbres d'Onyx d'Algerie," carried on under the general and commercial direction of M. Viot, and under the artistic guidance of M. Cornu. For perfect execution, the happiest appreciation of the decorative uses to which objects in such precious materials can be applied, for judicious combination of those materials with metal and other mountings, and indeed, for general successful results, this beautiful display was at once considered worthy of the highest ordinary distinction the jury could award to it. As even more perfect than the Algerian onyx-works, I certainly hold the exquisite

cabinet specimens of jade, rock-crystal, &c., forming the Guthrie collection, exhibited through Messrs. Phillips Brothers, of Cockspur Street, London. These works, however, not being exhibited by their manufacturers, could be admired, as they certainly were, but could not be brought under any conditions which could justify the award of a prize for them, at any rate in our class. The beautiful mosaics of precious stones, inlaid at Agra, &c. and forming chess-table tops, inkstands, &c., were also admired by the jury of Class 15, but felt to be scarcely within its province. Amongst other exhibitors of good work in precious, or at any rate exceedingly intractable, materials, the jury specially noticed the porphyry vases, &c. wrought at the usine of Mdme. Arborelius, at Mora Elfdalen, in Sweden, and the masterly treatment of Scotch granites by the well-known firm of M'Donald and Field. In softer but yet precious materials, such as marbles, &c., quantities of well-wrought chimney-pieces are exhibited, such as those of Geruzet, for the Pyrenean marbles, Becq, for other French marbles, and Leclercq, Willemotte, Crocquet, Courbain, Melot, and Louvencourt for those of Belgium.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Guthrie
gems.

Agra inlays.

Swedish
porphyry,
Scotch
granite,
French and
Belgian
marbles.

Respecting "moulded objects, and ornaments in plaster, "statuary, pasteboard, &c." there is not much to be said. All the various processes of reproduction by the use of elastic moulds are now so thoroughly and generally understood that every nation alike seems to employ them with almost equal facility and dexterity. From an educational point of view, the plaster casts of portions of great architectural monuments displayed by the Department of Science and Art are most important, and next, probably to these, from the same point of view, are the small specimens contributed from the Government School of Design of Vienna. In the manufacture of carton-pierre and plaster work, on the system patented by M. Desachy, under the auspices of Mr. Owen Jones, France certainly "carries off the golden apples," both for excellence and commercial development of the manufacture.

Objects
produced by
plasticity.

Plaster
casts.

Carton-
pierre.

The well-known houses of Crapoix and Hubert maintain their well-won leads, and are closely followed by Messrs. Jackson and Sons, of London. The English and French in this particular do not quite compete on equal grounds, for, while the French products have, for the most part, been chased-up by most skilful carvers, the English works are exhibited almost exactly as they have left the moulds. In this respect the French have taken, as I consider, no undue liberty, since it was, of course, open to Mr. Jackson to have worked up his goods to the same high degree of surface,

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Picture
frames.

finish, and undercutting. He preferred, however, to exhibit the products of his manufacture as they currently issue from his factory.

Amongst the "frames" there is a general average of excellence in the production of gilt frames amongst the leading nations of Europe. The French, English, and Austrian appeared to me to be the best, and the Bavarian, Belgian, and Prussian the cheapest. In carved frames, with perhaps, the solitary exception of one forwarded by the Society of Arts in London—which obtained special approbation in their last competition for prizes for skilled workmanship—Italy had it, I consider, "all her own way." The frame carved in walnut-wood from designs by Giusti, of Sienna, and some smaller specimens by Frullini and others were admirable, and in all respects constituted commendable works of art. Rowley, of Manchester, was specially noticed as a maker of thoroughly good ordinary picture frames, at moderate prices. The frames of several of the Prussian houses were considered to be extraordinary, for the prices at which they were quoted.

Painted
decoration.

Of painted decoration, the Palace of the Exposition contains but little shown as specimens by individual exhibitors, but the brush has been freely applied ornamentally to garnish the stands and inclosures which separate the products of the various nationalities—upon the whole, I think, most successfully in Italy. Turkey, in this respect, narrowly escapes being very good; and Germany has sought safety in a series of her usual half tints and neutrals, which scarcely sufficiently "furnish up" to the goods to which the walls, &c. serve as backgrounds. In Russia, it is to be regretted that the paint-pot has been allowed to spoil a quantity of admirable woodwork, which, simply stained or varnished, would have told its own tale, and looked exceedingly well. Because the French have not exhibited "decorative painting" in force, it is not to be inferred that they are wanting either in heads to design or hands to execute every class of such work. Paris itself—not in its great monuments only, but in every street, and almost in every café—is overflowing with protests against the injustice of any such supposition. Outside the walls of the Exhibition she is stronger in her display of this class of work than within it. In the pavilion of the Empress, in the kiosk for the Pacha of Egypt, in the Sultan's cabinet, and in many other works for all sorts of nationalities she has "lent a good hand," especially through the talents of MM. Dieterle, père et fils, Prignot, and Parvillet, artists and designers of the most distinguished merit. In reporting upon the class of paper-

hangings, I may, however, have occasion to dwell in greater detail upon this branch of my subject; meanwhile, should any sceptic doubt the French superiority in this department of art, let him only spend an hour or two attentively in the gallery of industrial designs and he will, I think, leave it a convert.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

On that important section of class 15, furniture, ornaments, and decorations for the services of the church, a whole volume might, of course, be readily written. As our limits are not of any such capacity, the remarks now to be made must be condensed within far too narrow a compass for the interest and gravity of the subject. To the visitor to the Exhibition it presents itself under two leading and distinct phases—viz., what is the present position of the various European nations in relation to church furniture and decoration, and what evidence does the Exhibition contain and afford of progress, or the reverse. Some time ago a broad distinction might have been made between the furniture, ornaments, and decorations intended for the services of the Roman Catholic and for those of the Reformed Churches respectively; but at the present moment such distinctions have been all but obliterated. It is indeed singular that some amongst the most costly decorations for ecclesiastical structures—such, for instance, as the magnificent Russian mosaics, those in *pietre dure* by de Triqueti, and the bulk of those exhibited by Dr. Salviati—should be intended for buildings in which Protestant rites are performed. In all countries alike the revival has been rather archæological than ritualistic in its origin, whatever it may be now; a spirit of conservatism for ancient monuments arose early in the present century, and embraced, of course, by way of reaction, most energetically those ecclesiastical structures which had most suffered, through revolution in France and Italy and general indifference in other countries, during the eighteenth century. The study of the monuments of ancient and national architecture speedily induced a corresponding study and fondness for the preservation of relics of ancient industries, and gradually the study led on to a desire for the reproduction of such relics, and ultimately for the reintroduction into general industry of the processes, and even of the forms specially affected at different historic periods. Thus, in every country, general industry has been enriched by the revival of many, until lately, dormant, if not extinct, arts and processes, and the equipments of the Church have correspondingly benefited. Still parallel with this revival, which naturally assumed a mediæval shape, there has existed, if not flourished, a style of church furnish-

Furniture
and decoration
for the
church.

Increasing
"luxé" in
the celebra-
tion of
religious
rites.

A revival
which began
archæologi-
cally, and
has become
ritualistic.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Chief la-
bourers in
the archæo-
logical re-
vival in
France.

And in the
ritualistic.

The move-
ment not
congenial to
the French
workman.

ing which has descended to our days from the exuberant wealth and flourishing condition of the Roman Catholic Church under the stimulating system of the Jesuits. The style to which I allude was "rococo" in the highest degree, and was the perfect embodiment of the maximum of drawing with the minimum of thinking; rich and florid, it rejoiced in broken and twisted scroll and shell work, ribbons, clouds, saints, aureoles, cherubs, skeletons, emblems, rays of light, and even flashes of lightning. At the beginning of the present century scarcely any church plate, furniture, or decoration of any sort of pretension was executed in any other style. In France the labours of enthusiastic archæologists, such as Albert Lenoir, E. H. Langlois, the Comte de Pourtales, Willemmin, Sauvageot, Du Sommerard père, De la Quèrièrè, Laborde, de Bruges, and Jubinal, stirred up the country to something better, and attempts were at first almost furtively made to smuggle into the sacristies of the principal cathedrals something more in consonance with the rare treasures of the mediæval period, which were still preserved in a fragmentary state at the backs of cupboards and in neglected drawers, than the motley incongruities to which allusion has been made. To these pioneers succeeded other supporters of "Romanticism," as it was stigmatised in the early days of Louis Philippe, when Victor Hugo, Dumas, Balzac, Soulié, the Bibliophile Jacob, and Sue, emancipated literature and the belles lettres from the fetters of academical tradition. France must ever lie under a deep debt of gratitude to those who have helped to confer grace and comeliness, reason and propriety, upon the revival of such national arts of the Middle Ages as might be made available for giving a fitting character of dignity and solemnity to the equipments of the restored monuments of her ancient faith. Among such may be classed conspicuously during the last 30 years, De Caumont, the Abbè Texier, the Pères Martin and Cahier, the Vicomte de Cussy, de Merimée, Rio, Questel, Lassus, Didron, Gerente, Lasteyrie, Du Sommerard fils, Maurice Ardent, Courmont, Labarte, Ferdinand Serée, and, "last, not least," Viollet le Duc. On all sides in the present Exhibition indications are given of technical dexterity in these revivals, but yet it is impossible to feel that they are other than exotics. There is an obvious want of spontaneity in the attempt of the art-workman of the Faubourg St. Antoine to carve or paint, or wield the hammer and the plyers, as the men of old did, under the active supervision of a Church which once swayed the wills and views, the hopes and fears, of labouring men, and held them bound under as potent spells as do now the tyrannies of trade

associations, and the mysteries of secret societies maintained in spite of law and reason for keeping alive the smouldering embers of red republicanism—with a curious undercurrent of Fourierism. How can a Church which has so far lost its hold upon the lives and consciences of those who can alone furnish forth its pomps and ceremonies expect a manifestation now of that real devotional spirit which characterised the old triumphs of ecclesiastical art and devotion?

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Both on the occasion of this and of the last preceding great Exhibition, I could not but become cognisant of the fact that the prevalent English idea of mediæval art is not acceptable to, or partly perhaps accepted by, the most accomplished critics of other countries. With much of what we produce in church furniture and decoration, and regard as fulfilling the true mediæval theory of art, they find fault because the work done fails to precisely recall the details of the remains of church furniture and decoration which they have most minutely studied. Thus in Germany the popular idea of mediæval architecture is concentrated (except, perhaps, in the theories of Herr Reichensperger and his school, which is a very small one) in the angularities and crinkled conceits of Erwin von Steinbach, Martin Roriczer, and Adam Krafft. In that style great quantities of church furniture and decoration still exist in Germany, and models suitable for exact reproduction abound. In England the case is very different. The iconoclasts of our Reformation did their work much more effectually, and left behind them but scanty evidence of the characteristics of the furniture and decorations which once adorned the structures they defaced, but could scarcely destroy. Hence it was comparatively easy for the English to reconstruct mediæval architecture proper (and in that we have been fairly successful), and difficult to provide consistent *instrumenta ecclesiastica*. The difficulty has been greatly increased by our predilection for early pointed Gothic architecture, remains of the decorative adjuncts of which are even scarcer than those of the later styles, and of which fewer representations exist in illuminated manuscripts. Such adjuncts the English have, therefore, been compelled to a great extent to invent; and foreigners, not being well acquainted with the types upon which we have sought to reconstruct, fail to recognize the correctness and propriety of the reconstruction. In other words, they appear to admit frankly the beauties of mediæval design as a thing of the past. Conceding this in the present, they would preserve every vestige of it in a wholesome spirit of conservatism, and go even so far in restoration as to destroy with great cost and pains what they aim at pre-

The English
form of re-
vival or
"develop-
ment" re-
pugnant to
foreigners
generally.

In Germany.
Why?

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

In France
Now.

(Viollet le
Duc rather
archæologi-
cal than
ritualistic.)

serving; but as for the future of mediæval design, except as a blind reproduction, they fail to recognize or adopt it. For them it does not appear to possess such elements as justify its re-creation as a living style, intolerant of, and predominating over all others; such, in fact, as it would become if our English "development" theorists were permitted full scope. I am fully aware that one illustrious name in France—that of Viollet le Duc—passes current as an ægis for dogmatism on this subject; but those who would so use it can have but a poor notion of the breadth of that great writer's view, and the ample spirit of tolerance which distinguishes his practice. As he says, in an eloquent passage of the "resumé historique" of his "Dictionnaire Raisonné du Mobilier Français," "Nous sommes dans le temps des innovations en toutes choses : mais nous *inventorions le passé, parce que nous sentons qu'il nous échappe.*" And again, "Pour conclure, nous ne prétendons pas que la connaissance exacte des choses et des habitudes du moyen âge donne du talent aux artistes de notre temps qui n'ont pu en acquérir; mais nous sommes convaincu qu'elle doit aider l'homme habile et familier avec les ressources de son art." . . . "Nous ne prétendons pas qu'il faille, au milieu du dix-neuvième siècle s'entourer de meubles copiés sur ceux qui nous sont laissés par le moyen âge. Et s'il paraît ridicule aujourd'hui de voir une femme en robe bouffante assise sur un fauteuil imité d'un siège grec, il ne l'est guère moins de placer dans un salon une chaise de quelque Seigneur du quinzième siècle. Ce que nous voudrions, c'est une harmonie parfaite entre l'architecture, le mobilier, les vêtements et les usages. . . . Le signe le plus certain d'une civilisation avancée c'est l'harmonie entre les mœurs, les divers expressions de l'art et les produits de l'industrie."

The licence M. le Duc would thus freely accord to the equipments of our residences he would wisely and justly limit and draw tighter around the furniture and decorations of the church of the 19th century. Thus he would regard as abuses of the highest importance, when affecting ecclesiastical proprieties, slips of good judgment, and taste, which would be trivial only when committed by an individual. Ever since (he says) "a reaction has taken possession of us with respect to the arts of the Middle Ages, we have begun to fill our churches with furniture, 'soi-disant gothique,' ridiculous in form, unsatisfactory both in material and execution, and possessing no other merit than rapid perishability." Would I could add that much which I have seen here and there scattered about in England only possessed this last-mentioned quality in the highest degree. Anyhow, certain it is that

neither in 1862 nor in 1867 could any amount of arguing or persuasion induce the foreign jurors, generally, to look with satisfaction upon the forms of mediævality into which we had cast the bulk of our furniture and equipments for the service of the church. They would persistently maintain, firstly, that they were not beautiful; secondly, that they were not like any remains of mediæval ages they had ever seen; and thirdly, that in point of workmanship they were below the level of the best objects in other styles. In too many cases it was impossible to deny, conscientiously, that the strictures were just. The unfavourable impression made by the Ecclesiological Society's collection of "exhibits," to which obviously none but the "very pure" had been admitted, may be illustrated by the following passage from the report of the Belgian Commissioner to his Government in 1863:—"L'ex-
 " position d'ameublements et d'objets divers en style du
 " moyen âge, organisée par les soins de la Société Archæo-
 " logique fournit encore d'autres exemples tout aussi frap-
 " pants (de mauvais goût); mais ici c'est peut-être à l'esprit
 " de système qu'on doit les singularités qu'on observe. Il
 " existe une école qui semble entourer de son amour non
 " seulement tout ce qui nous a été transmis par le moyen
 " âge mais surtout ce qu'il a produit de plus naïf et de plus
 " barbare." While frankly acknowledging that a spirit of pedantry is more often exhibited in such goods than a spirit of beauty, an Englishman must wilfully shut his eyes who would refuse to recognize how large an influence for good has been exercised over even the nooks and corners of our native land—its village churches no less than its cathedrals—by those who have, by language sometimes a little over-harsh and contemptuous, roused us up from our lethargy, and shaken the old spirit of churchwardenism out of our drowsy constitutions. While Pugin specially addressed himself to revival for the sake of the Roman Catholic Church, the Cambridge Camden (ultimately the Ecclesiological) Society applied itself to the same task for the Anglican. With equal vigour, and, one might possibly add, with equal intemperance, both preached the soundest doctrine, in the most strident voice. Perhaps for great diseases harsh remedies were necessary; but now that the medicine has operated and the patient is better, he should forget the shaking up he received when he was awakened to the necessity of taking his draught. Because he may be better, it does not follow that he may be yet quite well; and there is still, I think, a wide field of action left for bodies such as the Council of the Architectural Museum, who might, if they would, greatly assist the good cause by directing the active energies of the art-workmen

In Belgium.
Now.Influence of
A. W. Pugin
on the
Roman
Catholic
and of the
Cambridge
Camden
Society on
the Angli-
can Church.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Rapid ac-
quisition of
power to
reproduce
mediaeval
architecture
satisfac-
torily in
England.

Action of
the Arundel
Society on
the art
element of
the move-
ment.

into the groove of beauty, and by keeping them away from the much easier courses of quaintness and eccentricity. Knowing, as all architects must know, how much behindhand we were, only some 25 years ago, in everything connected with the production of decent furniture, ornaments, and decoration for the services of the Church, due allowance should be made for any shortcomings which may still manifest themselves; remembering, at the same time, how much safer it is to recognize them, in order that they may be amended, than to shut our eyes to them and believe that we are "all right," and our contemporaries on the Continent all wrong. There will be found to remain, after making all reasonable and requisite allowance for drawbacks, abundant evidence of skill and capability on the part of designers and draughtsmen, makers and employers, buyers and sellers of ecclesiastical equipments of all kinds; and as compared with similar classes in any other country of Europe, we have little reason to fear invidious comparison. It would be, I think, unjust to a very active and very useful body to put upon record any impressions of the rapid advance made in England towards the revival of decent and artistic decoration for the offices of the Church without adverting to the service rendered to the good cause by the persistent labours of the Arundel Society. Instituted in the year 1830, in a noble spirit of conservatism, the governing body of this society has converted its efforts to do honour to the past into a powerful form of leverage upon the present. By sedulously putting before the artistic world careful transcripts of some of the most beautiful applications of art to the services of the Church in mediæval days, and in those of the Renaissance in Italy, they have supplied models which have proved of singular efficacy in preparing the way for practical revivals of similar good works, through the various media of wall and ceiling painting, stained glass, mosaic, engraving, illuminating, carving, &c. in this country of late years. It is true that, for a time, their labours were misapprehended, and that they were supposed to travel in too restricted an orbit; but as time rolled on, and men's minds turned seriously to the practical question of how to do now what great masters of old had done well in their days, a more just appreciation of the value of such models arose; and of late years the field of the society's operations has been greatly enlarged, as is evidenced by the form in which they now present themselves in a friendly alliance with the Department of Science and Art. In speaking of this society and its labours, shortly after the close of the last Parisian Exposition I gave expression to anticipations (in the following terms) which it is delightful to find have been fully and satisfactorily

realized, and the fruits of which are now to be seen in many departments of the British section. I then remarked, in addressing a public meeting at the Crystal Palace :—" I cannot conclude without expressing my earnest hope that you will not carry away the impression that studies of an archaeological nature and the carrying out of objects such as this society has attempted are without their practical importance in this generation. Any glass-painter, or wall-painter, or any artist occupied with sculpture in any material, must gain a great deal from a study of the frescoes and ivories reproduced by the society. They will, in the first place, see how important it is to endeavour to stamp their works with a legitimate connection with each other, and to give them that dramatic interest which is indispensable to command the emotions of the beholder. A single picture, separated and isolated, cannot, of course, represent a course of action or take cognizance of circumstances which may have preceded or followed the moment selected for representation; but, in a series, that connection of incident can be indicated which converts art from a lyric into an epic, and gives it an all-powerful and moving influence over the popular mind.

" Again, any artist who will study these works will find that whenever the simple expression of any natural emotion or any tender sensation has been honestly carried out, everybody must be struck with the power of it, and will be ready to overlook almost any amount of technical imperfection. Further, they give us an interesting illustration of a very difficult practical question which is every day presenting itself—namely, how far it may be possible to unite with truth and sentiment a just sufficient amount of archaism in form to connect itself without jarring upon our senses with the mediæval style which, in modern works of that character, we are bound to preserve and carry out? They show us that a mode of mural decoration may be used which shall express all needful qualities of thought and feeling, and shall yet assimilate by its peculiar angularities to an early style of architecture without shocking the feelings by any gross want of drawing or absence of human emotion and character. A very little addition, by way of correction, to the design of these frescoes is quite as much as the eye can desire, which wants rather to see the subject of the picture and the thought of the painter than to ascertain whether the work is well executed mechanically and with what amount of dexterity. It is not by attempting on all occasions to put Raffaele where Raffaele ought not to be that we can obtain those effects which neither Raffaele nor Giotto ever aimed at without realising."

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

In various
branches of
industry.

Especially
in adapting
the past to
the present.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

The revival
in Belgium;
tribute to
three
Englishmen
King, Philp,
and Weale.

After France and England, there is no country of Europe in which a greater effort has been made to emancipate the Church from the old Jesuit rococo style, which even yet prevails too much, and to substitute for it something in better keeping with the noble old mediæval monuments of the land than Belgium; and it is gratifying to notice how largely this improvement has been assisted by the knowledge and labours of three Englishmen. The names of Messrs. King, Philp, and Weale will at once occur to the recollection of all who have watched the Belgian movement with interest. The first named has dedicated himself to the illustration of, and the furnishing of models for the reproduction of mediæval ecclesiastical buildings and furniture, from the largest structure to the smallest specimen of goldsmiths' work. The second has conducted practically a manufactory in which the old Belgian "dinanderie" or latten work has been admirably and economically reproduced; and the third is acknowledged to be the most ardent, if not the most learned, writer on Belgian archæology. He was the ruling and moving spirit in the formation and illustration of the beautiful exhibition of church furniture, &c. ancient and modern, which took place at Mechlin in 1864, and which for the first time revealed to public admiration the treasures long hidden in the out-of-the-way churches of Belgium, and especially the masterpieces of that Cellini of the early thirteenth century, Hugo d'Oignies.

The revival
in Spain.

In Russia
and in Italy.

In Spain the spirit of conservatism of ancient monuments of all kinds has been rapidly increasing of late years; but, unfortunately, wars, pronunciamientos, and individual speculation have left comparatively few models to serve as the basis for any great change in church furniture and decoration. In Russia a more active spirit is alive, and the Government, in nourishing the national spirit, nourishes with it much external grandeur and dignity in everything associated with the peculiar national church. In Italy the exigencies of the State limit expenditure upon ecclesiastical decoration. What is done, however, is generally upon a magnificent scale, and in a noble if somewhat impure and overloaded style.

The revival
now shown
in the Exhi-
bition in
France.

Having thus generalised upon the relative positions of the various European nations in relation to church furniture, ornaments, and decoration, it may be well to point out briefly what the Exhibition contains most noteworthy in this department. Attention has been already paid to the mosaics, which are the principal novelty on the present occasion. Commencing with France, the ecclesiological student may be directed to a structure in the park, which it is scarcely less than an insult to the present state of architectural knowledge

in that country to call a church or chapel. It is filled throughout with altars, fonts, pulpits, retables, grilles, images, lamps, "coronæ lucis," plate, vestments, hangings, sacristy fittings, &c.; and not only are these objects less favourably displayed than they were in 1855, but they are for the most part of inferior quality. The best object is, I think, the massive corona lucis by Poussielgue Rusand, which hangs in the middle of the chapel. Bonet père has a tolerable stone altar, as has also Olivier. Grados shows skill as a zinc-worker, and the difficulties of bossing and shaping are well got over. Several of the great ironfounders, as Ducel and Durenne, exhibit grilles, &c.; but rarely in satisfactory designs for the material, cast iron, which never looks well when it assimilates too closely in style of design to wrought iron. Upon the whole, the French cannot be congratulated upon their exhibition in this section.

I have already indicated the aspect under which our mediæval work generally appeared to the majority of my jury. The only "exhibits" which met with much commendation were some of the excellent wrought-iron work by Messrs. Hart and Sons, of London, and by Messrs. Barnard and Bishop, of Norwich. Mr. Skidmore's clever work failed to please, as did, in different ways, much church furniture and decoration, which meets with ready sale and much encouragement in England, such as forms the current production of houses in that special line—those, for instance, of Messrs. Cox and Co., Jones and Willis, Frank Smith, Heaton, Butler, and Bayne, O'Connor, &c. The cartoon for the mosaic of the Last Supper, destined for the reredos of the Westminster Abbey altar, prepared by Messrs. Clayton and Bell for execution by Salviati, was warmly and justly commended. A small piece of furniture, executed from designs by Mr. Charles Foster Hayward, was admired; but with that exception, and with that of others already mentioned, I am bound to confess that but little of our ecclesiastical and mediæval work met with any other than very "faint praise."

In England.

In Belgium.

In the Belgian department, the great pulpit, by Goyers, of Louvain, was held to be good for its money, as, in the Dutch, was that of Cuypers, of Amsterdam; in both, however, it was felt that errors had been committed in too much imitating in wood architectural forms, parts, and proportions special to stone. In this particular a very favourable contrast was held to be shown in a very pretty "priedieu" in the Austrian department, executed by Leimer, of Vienna, and in one or two of the cases and portable shrines shown in the Bavarian section.

MR. DIGBY
WYATT
ON DECORA-
TION, &C.

Good me-
diæval lead
work in
France.

Summing
up.
General
signs of
progress in
France.

The best church works in the whole Exhibition were considered to be some of the admirable reproductions of mediæval lead ornamentation by Monduit and Bechét, of Paris, and the general precious metal work of Thierry, Rusand, Skidmore, and Bachelier. As all of this will, no doubt, be more properly estimated by reporters on other classes, it may suffice here to simply indicate its general excellence.

To sum up the general impressions I have derived from a close inspection of the whole Exhibition, as to the relative progress in the arts of decoration made by each nation since the last universal Exhibition, I may state advisedly that I look upon the advance made by England as the most rapid and meritorious of all. France, on her own ground, is master of the position, so far as the universality of "esprit" in every branch of production is concerned. Her artists are most dexterous and prolific, but stand frequently in need of correction when their exuberant fancies lead them into trivialities. On all sides in her beautiful Exhibition, there is evidence of the danger which besets the too ready hand, which runs away as it were, with its possessor. Because an artist can "touch off" a wreath of flowers with enviable facility, there is no reason that we should be "smothered with roses" on all occasions. All that France needs now is greater chastity of taste and more elegant simplicity; in richness she is without a rival.

In England.

England manifests signal improvement rather in the suppression of the violently bad than in the achievement of perfect success in what is absolutely good. What our industry still shows the want of is workmen who can paint and model with tolerable facility. In decorative painting in artificial keys and scales, as "en camaieu," "en grisaille," "rehaussé d'or et divers métaux," &c., and in cabinet sculpture, the French training of the workman, and especially his comparative sobriety, give him a great advantage over the corresponding class in England, and the national products show it. Still, both design and execution in all branches in both countries are much better than they were, and an average good quality is infinitely better sustained than it used to be, even half a dozen years ago.

In Austria.

In Germany, Austria has advanced more than Prussia; since the former country shows much less of that extravagant rococo or bad imitation of Louis Quinze work, than she used to delight in; and the latter has acquired a certain stiff ungainliness, of average good intention, and has apparently lost much of the more refined classicality which Schinkel and his school brought into vogue. In Bavaria, Holland, and

Of retro-
gression in
Prussia,
Bavaria,

Belgium there are signs of retrogression. Russia is much where she was, and the other northern nations are rather improving. Italy is becoming more showy in style, but with certain exceptions remains less true to her old traditions of excellence.

Happily, India is still the glorious old India all true artists have learnt to venerate; and it is amidst her treasures and those of other Oriental nations that more inspiration is to be acquired than elsewhere in this grand and unrivalled gathering of the nations. Let us hope that British working bees will visit the great hive in thousands and come back "laden with" honeyed spoils" to enrich and benefit themselves and the industrial arts of their native land.

MR. DIGBY
WYATT
ON DECORA-
TION, &c.

Holland,
and Bel-
gium.
Italy, doubt-
ful, but
India still
the true and
honoured
teacher.

REPORT on CRYSTAL and FANCY GLASS—(Class 16.)—
By HENRY CHANCE, Esq., M.A.

MR.
CHANCE ON
CRYSTAL
AND FANCY
GLASS.

MY purpose being chiefly to call attention to objects worthy of special remark in the foreign division of Class 16, I shall content myself with a very brief notice of the English portion. The exhibition of English glass is, as a whole, very incomplete. In crown and sheet glass there is only one exhibitor; in plate glass there are none; and even in flint glass the manufacturers, properly so called, are very inadequately represented.

English
glass.

In spite, however, of this deficiency the exhibition of English flint glass is in many respects exceedingly good. The glass is more brilliant than that which is exhibited by other countries, this superiority being attributable partly, perhaps, to the composition of the glass, but mainly to the higher polish given to it. The colour is generally, though not uniformly, excellent, a slightly purplish tinge being occasionally observable.

English
flint.

Mr. Copeland exhibits some glass made with American sand, and which in purity of colour is, I think, unrivalled; but this sand is too expensive for ordinary use.

Mr. Cope-
land.

The engraving of the English glass reflects the highest credit both on the designer and the workman. The engraved glass of Mr. Dobson, and of Messrs. Millar, of Edinburgh, is specially worthy of notice.

Mr. Dobson.
Messrs.
Millar.

Messrs. Phillips and Pearce have some very good imitations of old Venetian glass, and a chandelier for eight lights of a character different from that of any other in the Exhibition.

Messrs. Phil-
lips & Pearce.

The chandeliers of Messrs. Osler were, unfortunately, not erected in time to admit of their being examined by the jury. The quality of the glass is exceedingly fine, and the smaller chandeliers are very elegant. The tubes conveying the gas to the burners are very skilfully concealed.

Messrs.
Osler.

The bottles exhibited by the Canada Glass Company are worthy of notice.

Canada Glass
Company.

The English exhibitors of flint glass confine themselves almost entirely to pure white crystal. In coloured flint glass the foreign exhibitors stand quite alone, and the variety, taste, and ingenuity which they have displayed in this beautiful manufacture cannot be too highly praised.

Foreign
glass.

The Baccarat Company exhibit two very large vases and a centre tazza of white and ruby glass (flashed), the cutting

Baccarat
Company.

MR.
CHANCE ON
CRYSTAL
AND FANCY
GLASS.

St. Louis
Company.

showing the clear glass. The ruby colour is very brilliant, the engraving is well designed and most carefully executed. This company exhibits, also, some very beautiful vases of blue or ruby glass flashed on opal, a large portion of the coloured glass being cut away so as to expose the opal.

The large candelabra of the St. Louis Company are very dull in colour. They exhibit, however, a very brilliant vase of white flint glass with twelve medallions, six of which are cut in relief, and the remainder produced by the action of hydrofluoric acid. This latter method of ornamentation is used to a considerable extent in the glass both of St. Louis and Baccarat, and with very good effect. The coloured glass of the St. Louis Company is very fine, and I would call especial attention to their ruby obtained by staining instead of by flashing.

M. Monot.

In the collection of M. Monot there are two large candelabra remarkable for the whiteness of the glass. There is nothing in the English department (except Mr. Copeland's glass, to which I have already alluded) superior to them in point of purity of colour. M. Monot exhibits, also, some fine imitations of Venetian filigrana vases and tazze, and a fine vitro-dittrina goblet. I was very much struck also with the green and amber colours displayed in his caskets, vases, &c.

M. Maes.

There is much that is attractive in Mr. Maes's collection, especially the very thin flint-glass goblets, cups, and decanters, covered with a light gilt pattern. These glasses are of the most delicate character, and must have been the production of a very skilful workman.

Austrian
glass.

In the Austrian department, no one, I think, can fail to admire the white flint glass exhibited by Mr. Lobmeyr, in a great variety of forms, all in good taste, and admirably worked out. His dessert service, with the candelabra formed of a combination of metal and glass, is, both in point of design and execution, one of the most beautiful displays in Class 16. He exhibits also a very elegant chandelier of the same character.

In many of the other collections of glass in the Bohemian and Austrian department there is much that is interesting; vessels of green glass in the old style, enamelled with arms; vessels bossed with imitations of precious stones; and a great variety of vases of the well-known Bohemian glass.

Russian
glass.

The exhibition of opaque glass, in the Russian collection, of almost every tint, and the vessels of a rich deep red colour, composed of a glass called Pourporine, will well repay a careful examination. These glasses have been pro-

duced at the Royal manufactory at St. Petersburg, under the superintendence and from the receipts of M. Bonafédé, chemist to the Royal establishment.

MR.
CHANCE ON
CRYSTAL
AND FANCY
GLASS.

One of the most interesting collections of glass is that of Dr. Salviati, in the Italian department. I would mention specially the following—a very fine chandelier of the old type, the flowers worked out with great delicacy and clearness; a large and two smaller “specchi,” ornamented with wreaths, flowers, &c.; and a great variety of bawling wine glasses and goblets, basins, plates, vases, &c. of different forms and colours. Although it would be too much to say that these productions come up to the old Venetian glass, they are, nevertheless, exceedingly creditable to Dr. Salviati, who has had many difficulties to overcome in bringing them to their present state of perfection.

Italian glass.

To revert again to the French department, the collection of M. Paris is remarkable for the great variety of coloured crystal glass, lamp-glasses, enamels, and pipes and other articles of metal enamelled with glass.

France.

In plate glass the St. Gobain Company have succeeded in producing a silvered plate which measures 5.90 by 3.68 metres, equal to a surface of more than 21 square metres. They exhibit also a clear plate of about the same size.

Plate glass.
St. Gobain.

The plates exhibited by the companies of Cirey and Montluçon are also of very large dimensions.

Those of M. Patoux are smaller but of excellent quality.

M. Patoux,
&c.

In point of surface, the glass of Montluçon is superior to that of other exhibitors.

Brosette and Co. exhibit glass silvered without the use of mercury, avoiding thereby the use of a material very injurious to the workmen. They silver annually more than 20,000 square metres of glass by their process.

Brosette &
Co.'s sil-
vered glass.

I ought not to omit to call attention to the moulded flint glass exhibited in the department of the United States of America. The glass itself is inferior both in quality and colour, but is remarkable for the success with which large vessels have been moulded in one single piece, without showing any trace of the mould.

American
glass.

In the process of manufacturing glass the most important change that has taken place of late years is the employment (for melting the materials of which glass is composed) of Mr. Siemen's regenerative gas-furnace instead of the ordinary furnace heated by coal. This process has been adopted to a considerable extent in England in the manufacture of crown, sheet, plate, and flint glass. In France the flint-works of Baccarat, St. Louis, and Clichy (M. Maes), and

Siemen's gas
furnace.

MR.
CHANCE ON
CRYSTAL
AND FANCY
GLASS.

the plateworks of St. Gobain have adopted it; but in the latter country it has not yet been employed with success in the manufacture of sheet glass, bottles, or common table glass. In Belgium it is employed in the flint-glass works of the Herbatte Company. Hitherto, in applying this process to the manufacture of flint glass, it has been necessary to use covered pots, as under the old system, it having been found that some of the gases passing through the furnace deoxydised the lead (used in the composition of the glass) when exposed to their action in open pots.

This difficulty has, however, been overcome by the company of St. Louis, who have succeeded in making flint glass in open pots by Mr. Siemen's process, with certain modifications, coal being the fuel employed.

I cannot conclude without tendering my best thanks to my colleagues, M. Bontemps and Mr. Cooke; to the former for much valuable information, and to the latter for the use of his notes on various objects of art exhibited in Class 16.

REPORT on PAINTING on GLASS.—(Class 16.)—By
T. GAMBIER PARRY, Esq.

MR. PARRY
ON
PAINTING
ON GLASS.

THE art of glass painting can rarely receive justice in a general exhibition. Its dimmed light is injurious to most other objects. It is as exclusive in an exhibition as a beech tree in a forest, under which nothing else will grow. It would be difficult to place it under more injurious circumstances than in the present instance. The principal collection of it is in the great corridor leading from the Trocadero entrance, where works of all variety of dimensions and character are consigned to a height equal to the clerestories of some cathedrals. At several principal entrances there are screens filled with painted glass, where the light is nearly equal on both sides, or the glare of other objects renders all attempts at a fair exhibition of its futile. These and other objections may account for the absence of works from establishments of acknowledged superiority in their several countries. The well-known names of Bertini in Italy, Capronnier in Belgium, Ainsmüller in Germany, Gerente at Paris, and Clayton and Bell in England, do not appear. From these various circumstances rather than from any inferiority in the works themselves the present Exhibition does not fairly or adequately represent the art as it is now advanced in Europe.

Difficulties
of such an
Exhibition.

One matter of real and general interest—the distinctive characteristics of the various national schools of this art—ought to have been the prominent object in their arrangement. In place of it we have a medley of confusion. The English works are all together, of all styles and qualities, in close juxtaposition ruinous to their effect. A great array of French works opposite to them are in similar circumstances—one with a western, the other with an eastern, light—so that when one side is light the other is dull. The two schools can never be fairly compared; beside which, the scattering of specimens all about the Exhibition is very injurious. In short, painted glass is the one art treated with indifference—its specimens are put about anywhere, without classification and without regard to place or distance. This is less the fault of the Commission than of the building, where no proper place whatever was provided for works of this art.

In France the system now generally prevails of giving a semi-opaque solidity to the glass by the use of various ena-

Technical
treatment of
the art in
France.

MR. PARRY
ON
PAINTING
ON GLASS.

mels, and of the general adoption of a pictorial treatment of subjects not merely irrespective of the styles, but of the forms also of the architecture in which they are set. The use of adventitious enamels for solidifying the effect of the glass was justified to the writer by one of the principal French artists on the ground of the difference between the bright light of the Continent and the sombreness of England. No doubt, in works of professedly modern pictorial effect, an artist may do as he likes, and must be judged accordingly.

In the earlier styles of the thirteenth and early fourteenth centuries the mellow effect was produced by the quality of the glass. This quality is now reproduced, but French artists rarely avail themselves of it. Specimens of materials for glass painters are exhibited by Bitterlin, of Paris; Jonet and Cie., Deviller and Cie., and Lambert, from Belgium; Wisthoff, from Prussia; and Messrs. Chance and Messrs. Powell, from England, and others.

Another leading glass painter, confessing with regret how few of his art were worthy of being called artists, allowed that the modern pictorial treatment was bad, but commercially inevitable for a public which had but little knowledge or care for the proprieties of the art or discrimination of its merits. It is a pity, indeed, that an art of such power and beauty should be sacrificed to such considerations. No doubt "the public" is, en masse, an animal which prefers pleasure to principle—and little wonder! in an age when old truths are regarded as little else than the scales which fell from the eyes of the blinded apostle.

Technical
treatment of
the art in
Germany;

The Germans follow much the same system. Their use of enamel is commonly heavier than the French. Their windows are usually dull when the colours are light, or heavy when the colours are powerful. The character of their design is apt to have a certain primness and stiffness in it, which, however, is preferable, in association with definite architectural forms, to the excessive freedom of the opposite fault.

in England.

The English are open to very severe criticism on many points, but their appreciation of the excellences of ancient art has induced their more general adoption of a material and a system of its use more consistent with the nature of the glass itself than is commonly found in other schools. A lustrous refractive glass is generally used by them for its rich mellowness, which much semi-opaque enamel would mar. Such enamel on glass is much like breathing on a gem. Transparent coloured enamels are also very little used in England, on the same principle that we desire rather to gain a purity of effect by qualities of the glass, while they follow throughout a more artificial system. The genuine Gothic feeling and

drawing, both in figure and ornament, are much more truly expressed by our painters than by theirs; but in the high quality of drawing and knowledge of the figure they are far superior to us. Their works are more generally those of artists by education, while ours are commonly left to ignorant feeling and intuition. There is no more fatal mistake than that anyone can draw well enough for a Gothic window. Indeed, no man could draw too well. None but the most educated hand and refined sentiment to guide it could combine the excellent beauties of "style" with the high character of expression demanded by modern experience. The variety of styles are to his art what the variety of mode and metre are to music or to poetry. The wretched result of consigning this art to inferior hands and minds is to discard so many characters and modes of expression, and to bring all work to one level of sameness and insipidity.

In reviewing the works sent for exhibition, it is proposed to take them in the following order:—Firstly, those of M. Maréchal, of Metz; secondly, those in the French model church; thirdly, those in the great vestibule at the entrance Côté de la Seine; fourthly, those on screens or otherwise scattered.

M. Maréchal's collection extends over the range of art from the earliest style of the 13th century to the most modern glass photograph. It is seen with the most flattering advantage, possessed by no other, in a building specially constructed, with a soft and steady north light, and within agreeable range of sight. The two eyes of this collection are two enamel paintings on glass of the finest kind, and of great artistic merit. Of their particular phase of the art they are great successes. One is the portrait of M. Maréchal, the other represents an incident in the life of Tobit. They have the appearance of two rich oil paintings rendered transparent. They are produced by the combination of transparent and opaque enamels, and entirely exhaust the resources of the art. Perhaps their greatest excellence is in the production of deep shadows, without that opacity common to other attempts of the kind, as in the copy of the "Deposition," by Rubens, by Mr. Lovin, of Chartres, in the great vestibule, where the black shadows equal even the coarse productions of the school of Van Linge; and as in a portrait of the Emperor, by M. Schmidt, of Aix-la-Chapelle, where the dense opacity of the shadows repels the eye, while the lights are glaring.

M. Maréchal's two pictures on glass are finished with all the care of a miniature-painter. It must only be a question *how far* such works are desirable.

MR. PARRY
ON
PAINTING
ON GLASS.

Glass painting
with
coloured
enamels.

MR. PARRY
ON
PAINTING
ON GLASS.

The argu-
ment pro
and con.
coloured
glass pic-
tures.

M. Maréchal desires to show how pictures of the highest class may take their places in windows as well as upon walls. He says that windows have hitherto been painted for churches—he wishes to paint for palaces. Is not the painful and laborious education, upon which alone the greatest works of art can be produced, thrown away when its highest strains (such as he would, apparently, so apply) are expended upon the most fragile of all materials, and subject daily to the mean risks of curtain-rods and shutter-bars, the house-painter's ladders, and the housemaid's spider-broom.

There is plenty of room for genius of the *highest order* in this art, though not of *such application* of it as this; but rather in vigour and rapidity, in works dashed off with all the breadth, boldness, and refinement of the most flying but most educated hand.

Donatello, Ghiberti, Perino del Vaga, and Perugino designed for glass. Those giants were not too big for such an art. Their remains in it are but few indeed. Their style may be in a degree inferred from contemporary works, and they are grandly bold and vigorous, and, in their best specimens, rich in that refinement, too, from which a true artistic sense could never err, even in its most dashing and reckless humour.

That art had been first perfected north of the Alps. Its quaint drawing was its fashion, not its feebleness. A fine artistic sense and dashing hand had ever been and ever must be, if it be rightly understood, the characteristics of that pure art of window jewellery.

How different is all this to the art pressed forward, and with much admirable talent, by the leader of the modern French school! His ideal of high art would utterly destroy the idiosyncrasy of the art of glass—an ideal which would bring all the phases of the painter's art to one dead level of similarity. Why should not glass glory in an art *all its own*—an art as high as thorough knowledge, vigour, rapidity, and refinement together could make it? These remarkable works of M. Maréchal's may remind us of the glazings of Vandyke and the miniature stippling of Mabuse—many may admire these qualities, but they would be better in a less fragile material than glass; works which when injured, to mend them is to mar them. They are works of labour misplaced and genius misapplied. They may be made now and then to show what transparent enamel can do, but the world cannot afford to buy them; and, as the greatest compliment to them, it may be said, Fine Art *cannot afford* to risk them.

In the same collection is a large subject of four ascending saints. It aims at much the same results as the two windows just described. It must be judged upon its own standard. It is entirely realistic. It ignores all limitation of treatment and material, and, by assuming all the qualities of an ordinary picture, it defies a criticism which it will not bear—for, however good the mechanical part of it may be, and rich the colour, the real art of picture, upon which it presumes, fails: for the figures are tame and expressionless, and, especially that of St. Barbara, not well drawn. Had this work been one of more genuine glass-painting—namely, vigorous, rapid, conventional, and suggestive, such as the character of the material demands—any such criticism would have been utterly out of place.

Near the outer door are four panels for M. Violet le Duc's studio. They are evidently intended as a pleasant substitute for a muslin curtain. The whole of the ornamentation, and especially the right-hand figure, is gracefully and charmingly executed.

M. Maréchal is an artist of much power and accomplishment; so much the more, therefore, would he be doing injury to his art by his advocacy of a highly-wrought pictorial system on a large scale. It catches the eye, and excites the applause of the public, but at the same time it deprives the pure art of glass-painting of its special genius and would bring its works to the routine level of gallery pictures. Rather let buon-fresco and oil, wall paintings and easel paintings, and paintings on glass, retain their special qualities, and thus magnify the art by presenting, with excellences proper to each, so many and diverse modes and methods of expression.

Near to M. Maréchal's collection is the Chapelle du Parc, in which are all kinds of church furniture collected by M. Lévêque. Specimens of his painted glass fill one of the transepts numbered 43. In one of the apsidal recesses (24) are windows by M. Ely. The central one, taken on its own ground as a piece of work professing extreme simplicity of treatment, must be commended for its modesty of feeling, general good taste, and bold use of lead. In No. 31 are three windows by M. Gsell Laurent, in three extreme treatments of style. On the left is one excessively archaic, and supplied with ample coats of artificial dirt, to give it mock antiquity. On the right is Titian's Assumption of the Virgin, worked into a rich transparency. In the centre is a pictorial design of considerable delicacy of sentiment and execution. It is purposely painted faintly, but with drawing far superior to what is at all commonly found among men

MR. PARRY
ON
PAINTING
ON GLASS.

of his craft. No. 45, by M. Lusson, is a boldly-designed window of late Renaissance style, spoilt by the thin, smooth quality of the glass, and further spoilt by the commonplace border all round it. No. 5, a transept filled with glass, by M. Bazin, in the style of pictorial transparency now most common and apparently popular in France—a style associated with Gothic architecture, but utterly contemptuous of all Gothic precedent, principles and restraints, and substituting for them neither greater delicacy of art, nor grandeur of effect, nor aught else which conduces in ecclesiastical art to the refined expression of religious sentiment.

In a building for the exhibition of photo-sculpture are specimens of small domestic windows, in the style of Dutch and Flemish glass of the sixteenth and seventeenth centuries, by M. Lafaye. Some of the heads are etched with great refinement, and the heraldic framework is boldly coloured and strongly leaded. The contrast of the two qualities is too powerful to be agreeable; but they are successful for what they profess to be.

Works of
English
artists in the
great corri-
dor.

In the great corridor, Côté de la Seine, the height and close juxta-position of glass of different style, quality, and dimension is most injurious, and any delicate work hardly appreciable, even with an opera glass. On the right side on entering, the works are principally English. On this side most worthy of notice is a large window by M. Geyling, of Vienna. What is good in it is the evident intention of working in some degree architecturally; what is unsatisfactory is the entire want of any balance or relation of colours. The qualities of the blue background of the figures and in the canopies above and below seem to put the rest out of gear.

The works in this gallery are not numbered. Near the first mentioned is a large window for the South Kensington Museum. It is a bold essay of richly-coloured subjects in the plainest mosaic glass; but the type of the figures is heavy and unpleasant. The action of the draperies needs more power by definite marking by lines or leading in a window composed on such a principle of bold simplicity. The glass is good throughout, the white silvery and refractive.

Next to it is a window by Mr. J. Powell, of Messrs. Hardman's, perfect in its style and admirable in its illustration of treating a subject which spreads over many lights by so composing the group in each light that it is perfect and distinct. The subject is maintained throughout. It fulfils the object of the painter without transgressing the composition of the architect. For merits such as these,

for its great refinement without throwing away unnecessary labour, this work is one of the greatest gems of the whole Exhibition.

Messrs. Lavers and Barraud exhibit two windows designed with much good feeling, and in admirable glass, but much injured by the too forced rectangularity of the leading.

Messrs. Morris, Marshal, and Co., have but three small specimens characterised by their usual combination of delicacy and vigour, sobriety and quaintness.

Over Messrs. Minton's stall a work by Messrs. Powell and Sons. A free and clever design of Renaissance arabesque, with medallions of colours; but the latter are too heavy for the former, which want force by the use of leading, which is here ignored. The glass is very good.

Next to it is a charming and original window by Messrs. Heaton, Butler, and Bayne. There is a simple refinement about it which is admirable. Two series of subjects cross the window in the character of a procession, but each group is composed for the light it occupies, except the last, which, as the sole infraction of the rule on which all else is so well designed, is to be regretted.

The next work by the same artists suffers from a plethora of subject. The glass and its treatment are excellent, but the juxta-position of ten crowded subjects without any borders produces a general effect of great confusion. The window is spoilt by the want of repose. The space which an artist grudges for borders is a gain to him in windows of this kind. Had it been one subject spread across several lights in distinct groups the case would have been different.

A three-light window, by Messrs. Powell and Son, is remarkable for the rich refractive quality of the glass. Remark especially the ruby and the colours about the canopies. The gray blue has been long a desideratum. This is equal to the fine old glass of the style of window in the clerestories of St. Germain des Prés and St. Eustache.

Near it is a large Renaissance window for South Kensington. In this, as in the former one, the medallion subjects are very heavily drawn and coloured, overpowering the rest. This, as in the former case, but more easily here, could have been in great part remedied by the bolder use of lead—the very fibre and sinew of work in glass.

Beyond this are two windows by Messrs. Ward and Hughes, designed and executed with much care.

At the garden end, under the clock, is part of a window, by M. Coffetier, in the small mosaic style of the thirteenth

French windows in the great corridor.

MR. PARRY
ON
PAINTING
ON GLASS.

century. It is admirable of its kind. Its archaic treatment of figures and ornament is consistent throughout, and very spirited.

On the east side, beginning from this end, is a large window, by M. Lusson. The figures of the celebrated female characters of the sacred Scriptures are disposed on branches of scrollwork, which cover the entire window. This groundwork is more fantastic than clever. The scrolls are often very awkwardly and inconsiderately designed, and so irrespective of the architecture that two mullions cut off, in the most unmeaning manner, two narrow strips of the central vesica. Such a design is more fit for a page of illumination than for the rigid divisions of a Gothic window.

M. Lorin, of Chartres, exhibits a copy of a picture by Rubens in the deepest colours and shadows of the deepest gloom, set in between accessories of foliage of the most harsh and gaudy contrast with the subject they surround. It is to be referred to no assignable style but that of modern Chartres, in every sense different from that of its old cathedral glass of world-wide celebrity. If there be any principles whatever in art, such works as this are but illustrations of labour misapplied and art perverted; if not, *à la bonne heure!*

The two small three-light windows of M. Thibaud, of Clermont Ferrand, and the three pieces above them, are pleasing from their simplicity, care, and absence of affectation, but of no great artistic merit.

The four large windows without name or number at this date (June 4), in the style of the thirteenth century, are weak from want of that variety of tint, hue, and tone, and quality of the glass, universal in that style, and the modern system of *matching* glass, which gives uniformity, and consequently poverty. In short, these windows are completely true to their style in everything but that one most necessary of all—the glass. The right glass for this style is now easily got, if the artist has the heart to use it. Compare with these washed-out specimens the central panel under the clock, by M. Coffetier, which sparkles with the power and jewellery of the old mosaic glass of that style.

Guilbert d'Anelle, of Avignon, exhibits a three-light window, drawn and painted with exceeding care. It is ruined by its place, height, and other glass close to it. There is a reposeful effect and modesty of taste pervading it, and a careful religious sentiment, which will make this work, in spite of its mixture of style and general peculiarity, a very pleasing one in the place for which it is designed.

The next is a most dashing work by Messrs. Goglet and

Cie., of Paris—a jesse tree, called “The Genealogy of the Ste. Vierge,” full of vigour in colour and execution. The wandering scrollage is justified by the subject, so executed in all styles. It is a powerful piece of artistic work throughout. The three upper ranks of figures are especially admirable.

Paul Chalons, of Toulouse, exhibits several small works, done with much care and a good deal of spirit. They are not altogether pleasing, but deserve examination: notice particularly the figure of David.

M. Lusson exhibits a Gothic window of several lights. He fills the upper half of them with rich canopies of the same style. Below them is a picture transparency of “the Entombment,” in style entirely modern, with a reminiscence of that of the school of Caracci. The group of figures is in an open cavern, designed without any reference either to the window itself, or the architectural forms and character of the artist’s own ornamentation. It is, indeed, a combination of most discordant elements, and has the effect of a modern paper transparency stuck up behind the canopies of a Gothic window.

A large work by M. Oudinot has much richness of colour, and is consistent in treatment with the styles of Dutch and Flemish work of the latest period. The mossy effect of the successive enamel-stippling deprives its design of all vigour, and the figures of such persons as those of the Deity and the Blessed Virgin are unpardonably wanting in all religious feeling; designed in a style presuming superiority to what is called “Gothic bad drawing,” but which itself draws worse, because more coarsely.

SPECIMENS IN VARIOUS PLACES.

At the end of the Rue de Belgique, Côté de l’Ecole Militaire, a large window of the Assumption of the Virgin, by Dr. Oidtman and Co., of Linnich, near Aix-la-Chapelle, challenges criticism on its own presumed ground of the most powerful artistic effect. If Gothic drawing be discarded in a Gothic window, because another style is better, *only let it be better*, and, *as such*, let it be *commended*; but here it is substituted by a style in which the figures and their draperies are lumpy and coarse to a degree. The violet blue of the background is out of harmony with all else, and the composition of the upper subject in relation to the arch above it and the outline of the mountain below it is painful and unartistic.

Miscellaneous works.

In the centre of three windows is one from the Royal Institute of Glass Painting at Berlin. It is a specimen of the treatment of glass most common throughout Germany.

MR. PARRY
ON
PAINTING
ON GLASS.

But for the use of lead, which is here most sparingly used, it would be very hard to recognize this large composition as a work of glass at all. All brilliancy is gone, as though it were painted on tissue-paper; it is tame and spiritless to the greatest degree. The canopy work is very well designed, in its special German manner, but all else is weak. Glass is, as it were, ignored throughout, and the design of the figure-subject is weak and weakly tinted.

In the Salon Royal, near the end of the Rue de Belgique, is a piece of very highly-finished enamel painting, "The Annunciation," by Dr. Oidtmann and Co. It is executed with much delicacy, and is so far good as possessing more force than is usual in works of that kind. The only assignable difference between this and a silver-paper transparency is its durability against damp. As it makes no pretension to style, it must be commended, on its own ground, as a copy of a modern picture exceedingly well executed on glass.

As a pendant to it is a large portrait of the Emperor of the French, by M. Schmidt, of Aix-la-Chapelle. It combines, in all their inevitable discordance of effect, the shadows of the deepest oil painting with the gorgeous illumination of a glass picture. The beauty of oil-painted shadows lies in their transparency and reposeful effect upon the eyes; but here they are dense, opaque, and resist the eyes. The lights of a picture are the reliefs of the design; but here they stare and monopolise the attention, putting the whole out of balance. This work is the inevitable result of trying to produce in one form of art what is the especial excellence and almost the sole property of another.

At the entrance of the Rue d'Afrique, M. Gesta, of Toulouse, exhibits two picture-windows in the modern French style of transparent and opaque enamelling on glass. The object is softness; the difficulty is to save it from degenerating into weakness. M. Feton, the designer of the larger of the two, can hardly be satisfied with his treatment by the glazier. His work is finished with the soft delicacy of a miniature painter, and then marred by a framework of garish colours in the lowest order of Gothic design. Next to it is a large window of five lights, by M. Laurent, of Paris. The lower part (the subject of the proclamation of the "Immaculate Conception") is an illustration of the modern French pictorial system, in which the composition being made wholly without reference to the architecture, the figures are cut by the mullions and the groups unavoidably divided into the most awkward proportions. Can these results recommend themselves either to

ordinary good judgment or to artistic sense? Would that glass painters could realize to their minds that designs for windows and designs for pictures must be composed on different principles!

MR. PARRY
ON
PAINTING
ON GLASS.
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At the entrance of the Rue d'Espagne there is an enamel painting by M. Lorin, relieved by a commendable fearlessness of bits of strong colour. Notice the two angels in the sky, over the Blessed Virgin. M. Lusson has here a window, of a composition similar to that of his work in the great corridor. The upper parts of the lights are filled with Gothic canopy work. The lower half of the window is composed without the smallest reference either to those canopies, or to their style, or to the architectural divisions of the window. A distinct view of Jerusalem, of a violet colour, suggestive, perhaps, of moonlight, sweeps independently across the whole window as a background to the group of the subject of the "Deposition," designed in the complete realistic manner of the day. It must again be asked, can such extremes of antagonistic elements in a window recommend themselves either to artistic or common judgment? and would it not be a worthier action on the part of a glass painter to design according to the exigencies of architecture and of glass, and, if he have the wish or the power, keep other classes of design for other classes of art? But, be his work what it may, at any rate let it be homogeneous.

Here are also some specimens of restoration of old thirteenth century glass. The old glass is lustrous and refractive, the modern pieces inserted are transparent; but it can be easily got of the ancient character. The old head of a "Majesty" is a very bold piece of that date.

At the entrance of the Rue de Lorraine, on a screen with light nearly equal on both sides destructive of effect, are small panels of domestic style, by M. Bourières, executed with much freedom and breadth. A "Martyrdom of St. Stephen," by Messrs. Erdman and Krémer, well executed for the style it professes—viz., that of the illuminations of the sixteenth century. The colours used in these become too powerful when literally translated into glass.

A "Transfiguration," executed with much care and power by M. Goussard, in the naturalistic style—unhappily marred by the crude taste and colours of the Gothic (?) canopy and other accessories.

M. P. Nicod exhibits a piece of work in the thirteenth century style, faultless in character, and of admirable glass, well broken about, and varied in design and colour. Below this is a careful copy in large sheets of glass of a picture by

MR. PARRY
ON
PAINTING
ON GLASS.

Present condition of the art illustrated by this Exhibition.

Principles and limits of the art.

Pietro Perugino. Ought such works to be done? If they be bad they ought not to be spared; if good they ought not to be risked.

The questions naturally suggested by this Exhibition are—what are the especial principles of glass painting, and what are its limitations? The art, as it is here presented, ranges over every possible phase, and, as a whole, it is an abnegation of any principle, and a protest against any limitation. Ought it so to be? Is it so with any other art? All productions of art are properly subject to two restrictions—the nature of their materials and the nature of the human eye. We have now to do with an art which is especially connected with those of architecture and of picture—with the former as an adjunct and ornament, with the latter as a sister art of colour and design. The nature of glass itself differs from anything else that those arts have to do with. Both these arts are based on definite principles and bound by definite limitations. Let a picture be black as night or fresh as morning, severe or sketchy, it will be good only if it have not transgressed the laws of chiaroscuro, of transparent and opaque colours, of colour in relation to light and shade, and of texture in relation to proximity or distance, and of linear and atmospheric perspective. Those involve principles that are inviolable, and beyond those limitations no good work ever was or ever can be produced. They are the natural laws of the materials in relation to the eye. The other art, architecture, whether classic, Gothic, modern, or aught else, has equally its laws and limits. It cannot without ruin transgress the powers of its own materials, nor can it, without offence, violate that science of numbers (the very soul of art, including that of music) which we call proportion. Is, then, glass painting to be free of all control—the only art let loose in the vanity of unmitigated fancy? A complaint commonly made by glass painters is that, if their art be tied by old restrictions, they have no opportunity of raising it. They demand freedom for “high art.” But, on a closer questioning, it is found that few of such complainants have studied general art principles at all extensively; and that, in the detail, knowledge, and drawing of the figure, upon the perfect acquaintance with which “high art” entirely depends, both their education and practice are still more at fault. The complaint, therefore, resolves itself into little else than impatience of the conditions of the art they profess. Precisely such impatience has led to the chaotic condition of modern architecture. If only they would recognize the dignity of their own beautiful art, and work within the sphere of “glass” without wandering into that of

canvas, and exert their powers in *perfect* truth of form and in that use of colour which distinguishes a window painter's glass from a picture painter's palette, we should then happily arrive at an art as "high" as the artist can produce, and one made perfect by being perfectly consistent with itself.

Pictorial effect is a quality common to sculpture, picture, and glass, though different in each. In the two first it is always regulated by the space it occupies. No figure-painter, no sculptor of alto or basso relievo, would so treat a subject, extending over a series of distinct spaces, as to ignore the forms of the architectural construction which bounded them. Each group would be complete; their connexion would be made by the interest of their story. The metopes of the Parthenon, to a certain degree, illustrate this. It is much to be regretted that glass-painters are impatient of this law, which binds all other arts. They also violate the very nature of their own materials in the attempted pictorial effects of atmospheric perspective. These are properly attained only by modulation of colour and loss of outline. Neither of these are properly producible, for modulation is impossible where every piece of glass is of a different tint; and loss of outline is impossible where every piece is held in its place by a black frame of lead. It is answered that these effects are possible, and easily produced by painting in coloured enamels. Let the answer hold good; but we come then to the question of other limits—limits of the right and wrong of human labour, and limits of the duty to human sight. Excessive "finish" is not a necessary quality of high art; the highest art is that in which the greatest conception is the best expressed. The too high-wrought picture in glass condemns itself by the prodigality of human labour on a material so fragile that the least injury would mar it; and, if the artist were dead or distant, it would be irreparable. It condemns itself also by offering such work as no eye can rest upon to analyse without pain and fatigue. The fault of ambition lies in the pretension of an unjustifiable independence. If the glass-painter be impatient of all limits, whether of architecture or of the special qualities of his own materials, limits, too, of the pleasure, power, or endurance of human sight and the use or abuse of his own labour, let him throw up his art and take to canvas. Then he may labour without stint and satiate the eye without fatigue; but if he is to be a glass-painter, let him honour his own art, and neither borrow the specialities nor wander into the province of another.

Much was said in the notice of M. Maréchal's works which might be repeated here. Nature may be prodigal of her ephemeral loveliness, because she can produce the same again

MR. PARRY
ON
PAINTING
ON GLASS.
—

to-morrow ; but Art cannot. If, therefore, there be any right or justice in the principles laid down here and throughout this report, glass-painting must be, as are all other arts, subject to principles and limitations. However high an artist's attainments may be it will give him room for them. It is an insult to art that all its forms and phases should be forced in one groove or ground to one level. A perfect work of art must be thought out in *its own language*. A picture-painter rarely designs well for glass, because he cannot think in glass, and he is often a bad judge of works in glass for the like reason—that he is always thinking in his own art-language, and mistakes for good what another art has borrowed and mimicked from his own. Hence it comes to pass that this beautiful art of glass painting is often misconceived both by artists and by the public. The art, with all its limitations, is large enough to open a field for ever to great genius and study. A man cannot draw too well for it, nor think too poetically; only let him remember into what he has to translate his thoughts—glass, lead, and light.

REPORT ON POTTERY.—(Class 17.)—By LEON ARNOUX,
Esq.

MR.
ARNOUX ON
POTTERY.

WE are called to report on a class of manufacture which for the last forty years has received a large share of public patronage. If at the commencement of this century a taste for historical pottery might be said to be concentrated in a very limited number of amateurs, it is unquestionable that since then there has been a complete revival of its appreciation amongst all classes. To-day, assisted by the translation of old manuscripts, the publication of technical treatises, daily articles in reviews and magazines, almost everybody can learn, converse, and satisfy himself about ceramic productions; and it is to this taste that we owe the formation of innumerable collections, amongst which stand pre-eminent the museums of the Louvre and South Kensington. The improvement in the processes and quality and the advance of art in manufactured articles have kept pace so well with this steady progress in the knowledge of the art, that it is difficult to say which has been foremost, or which was the consequence of the other. It is specially in France and in England that this movement has been the most decided, and we may estimate it to be in relation with the productive strength of these two nations.

General
taste for
ceramic
ware.

England
and France
the two
great
centres of
this manu-
facture.

Out of China or Japan, where a high estimation of fine pottery is traditional, but which are very indifferently represented in the present Exhibition, the manufacture of superior pottery, seated towards the close of the seventeenth century and during the first part of the eighteenth in the centre of Germany, was suddenly displaced and transplanted into these two western countries, which are at the present time the strongest and most advanced in ceramic art.

Let us state, before commencing this review, that the Exhibition, at least so far as our class is concerned, may be considered from two different points of view—the practical or utilitarian, and the artistic. This latter appears by degrees to gain upon the other. It is evident to us, recalling previous Exhibitions, that since, by their periodical recurrence, they have become an institution, and are undertaken not simply to enlarge and extend the ordinary channels of commerce, that the artistic element tends more and more to dominate over the commercial. The great mass of the public go to exhibitions, as they go to a museum, in search

Tendency of
the artistic
productions
to predomi-
nate in the
Exhibition
over the
commercial.

MR.
ARNOUX ON
POTTERY.

of pleasing excitement. They go to be astonished by the richness, the novelty, or the artistic quality of the things exhibited; and it is as much to satisfy this craving as from the natural effect of competition between establishments that desire to attract the public attention that our manufacturers find themselves engaged in a costly undertaking, under conditions not exactly such as they would have chosen if left to themselves. An inspection of the 17th class, we may say, of the whole of the third group, shows that this striving is apparent everywhere. Productions of an unassuming character disappear. We see that the small manufacturers, and those who do not employ clever artists, withdraw, and leave the burden of the competition to those who have larger resources at their disposal. What we now say is not intended to disparage the benefits which arise from these exhibitions—benefits we have already insisted upon in previous reports—but to explain how it is, if in the examination we are about to make, our criticisms appear to dwell more upon artistic progress than upon the practical side—the opening out of new markets, or the question of economy.

In this report, which is wholly independent of the jurors' examination, and which, relatively to the number of objects exhibited, ought to be short, we must avoid launching out into the region of technicalities. We shall limit ourselves to describe only the general characteristics of each kind of pottery, and to mention no more than is strictly necessary to understand the subject.

Pottery
divided in
two groups.

Two important groups present themselves for our consideration. The first comprises all pottery composed of a non-vitrified body, such as terra-cotta and fine and coarse earthenware: this is the lower order. To the second belongs all pottery composed of a vitrified body, such as stoneware and porcelain: this is the higher order. Each of these groups is capable of being subdivided into a very great number of different kinds.

First group
non-vitrified
bodies.

Proceeding, then, from the simple to the more complex we find, first, terra-cotta, which is intended to serve as a substitute for stone in architectural decoration. Terra cotta, when an ornament has to be repeated a great many times, has the advantage of cheapness over stone, and moreover, if well prepared, of greater durability. Stone that can be easily worked by the chisel and at the same time resist for centuries the inclemency of our rough climate is very rare. The resistance of terra-cotta, on the contrary, is well known; a glance at that of the ancients is sufficient

to prove that after several thousand years it remains as untouched as when it issued from the potter's hands. In Greece the use of terra-cotta was general; and, as evidence of the talent which was displayed in its decoration, we have only to examine the collections of the British Museum and of the Musée Campana. The Romans employed it in great profusion, and the Renaissance has left in Italy models Mr. Godfrey Sykes has most admirably availed himself of in the decorations at the Kensington Museum and Horticultural Gardens. The employment of terra-cotta in England has revealed a remarkable fact—that it does not blacken in the atmosphere as readily as stone, and can be much more easily cleaned. It is in Italy, France, Prussia, and Belgium that it is most generally used. The best example the Exhibition contains is the fragment of a façade exhibited in the garden near the Italian section by Mr. André Boni, of the National Manufactory at Milan. This specimen—very elaborate, in which the artist has striven to show all the resources that can be made available in this material for external decoration—is in the form of a gateway, the framework of which is ornamented and decorated with figures, whilst the space commonly occupied by the folding-doors of the gate is divided into a series of panels disposed in a way which brings to mind the celebrated Florence gates by Lorenzo Ghiberti, the whole being in the style of the Italian Renaissance. The figures are good in character and well drawn, the fine red tone of the clay contributing to set off the firm precision of the execution of this remarkable work, and giving it a metallic look terra-cotta does not generally possess. Though less artistically treated than the works of Mr. Boni, we must nevertheless quote those of Mr. March, of Charlottenburg, near Berlin. These will be found in the machine gallery, and in the great arch erected by Prussia in the principal axis of the same gallery.

MR.
ARNOUX ON
POTTERY.
—
Terra cotta.

Mr. André
Boni of
Milan.

Mr. March
of Charlottenburg.

It was by coating terra-cotta with opaque enamel that Lucca della Robbia made himself famous in the fifteenth century. Nevertheless, during the last three hundred years he has had very few imitators. Mr. Devers, who was one of the first manufacturers of faïence of the new school, exhibited some specimens of Robbia ware in 1855; and he now shows us others in the medallions of the Emperor's pavilion. Messrs. Virebent, Brothers, of Toulouse, who have a well-known manufactory of terra-cotta, present also an interesting example in an altar of Byzantine style, dedicated to the Virgin, and intended to be erected in the open air. The Virgin, carrying in her arms the infant Jesus,

Enamelled
terra cotta.

Messrs.
Virebent of
Toulouse.

MR.
ARNOUX ON
POTTERY.

occupies the middle of the piece; in the base are represented the apostles, the prophets, and Biblical subjects, painted in grisaille upon a blue-black ground; the whole forms an elegant object, sober in colour and pleasing to the eye.

Alcarazzas.

The Spanish Alcarazzas, which are of very primitive manufacture, but show great originality of form, are made with a clay very slightly fired, in order that the extreme porosity of the material, by bringing the water they absorb to the surface, should promote evaporation, and thus cool the temperature. The ornamentation in bold and multiplied relief, which is their chief characteristic, has no other aim than to accelerate the evaporation. In England, our clays, being too compact, are not suited for this manufacture, and our alcarazzas are more for ornament than utility.

Coarse pottery of the East.

The coarse enamelled pottery of the Orientals, such as that of Morocco, Roumania, or, better still, of the Ottoman Empire, affords a good illustration how, with very simple methods and a coarse material, vessels of a highly decorative appearance can be produced. The jugs and ewers of Dzeddah and the Dardanelles, whether black, relieved with a few touches of gold dashingly put on, whether of a deep green, or a white cream colour, set off with green patches, will be in request by artists who look for character in outline united to fine colour.

Many varieties of faïence and earthenware.

Leaving these simple productions to investigate those of a higher order, we experience considerable embarrassment, for we now come to a class of faïence exceedingly numerous in its varieties, and the name of those who practise this branch of industry is legion.

Any clay which, after having passed through the fire, preserves a certain amount of porosity, and which is then covered with a glaze, takes the name of faïence. When composed of a common body, and covered with transparent and coloured glazes, we have a faïence of the same description as that of Palissy. If it is made of a common clay, but coated with an opaque enamel, we get the Italian, the Delph, or the old French faïence, according to the degree of opacity in the enamel. Again, if clays of different colours are worked some upon the other, or some into the other, we have the old ware of Perugia, or that of Voiron, known as Henri Deux ware. If the clay contains sand, and is covered with a transparent and uncoloured glaze, we get the Persian ware; then, again, if the clay or body is of a fine description, white, and covered with a transparent uncoloured glaze, we have our cream-colour ware, or our earthenware, all of which are kinds of faïence. Then these various processes can

be combined together; and, further than that, they can all be combined upon the same piece. Let us endeavour to give a little order to our nomenclature, though a difficult thing to do, because of the great range artistic faïence takes.

MR.
ARNOUX ON
POTTERY.

The Palissy faïence is composed of a clay slightly coloured, covered with different glazes, which have been previously coloured by means of metallic oxides; these glazes of different colours being applied, some by the side of others, or blended one into another, according to the requirements of the decoration. This decorative process, although employed formerly by the Assyrians, the Egyptians, and all the nations of the East, was only introduced from Spain into Italy, and from Italy into France, towards the middle of the sixteenth century; and Palissy, as much by his energetic researches to discover the secret of their colour as by his wonderful talent for arrangement, and the skilful manner in which he coloured his reliefs, may be considered amongst us as the originator of this class of production.

Palissy
ware.

Mr. Pull, of Paris, and Mr. Avisseau, of Tours, devote themselves to imitate his works with scrupulous exactness. Mr. Pull, especially—a most enthusiastic potter—were it not for his integrity, would become the terror of all those who only collect ancient specimens. Remembering perfectly the original, which belonged to Prince Soltykoff, we consider his imitation of the little nurse of Palissy very successful; but the most remarkable piece of Mr. Pull is the reproduction in coloured glazes, of the chimneypiece of Germain Pilon, which is in the Louvre; the figures forming the sides are most harmoniously coloured.

Mr. Pull, of
Paris.

Mr. Avisseau, of Tours, has two beautiful rustic dishes; but in the larger one he has made a mistake in adding a border on a blue ground in the Italian style—this takes away much of the character. His attempt at Henri Deux ware, faïence of Voiron, is very imperfect. We must name, in passing, a very beautiful head of Minerva, by Jean Goujon, reproduced in three coloured clays, and covered with a transparent glaze. This will be found in Mr. Jean's exposition.

Mr. Avis-
seau, of
Tours.

It is interesting to note that Tuscany, the seat of the ancient Etruscan pottery, and Florence, the country of Lucia della Robbia, furnish the specimens of faïence made in imitation of those of the sixteenth century, and reproduced by the same processes that Horatio Fontana, Francesco da Rovigo, and many other illustrious men employed so ably. These processes, the Marquis of Ginori, whose family for 132 years has been at the head of the industrial movement in Tuscany, has applied to copying, as faithfully

Italian ma-
jolica.

The Mar-
quis of Gi-
nori.

MR.
ARNOUX ON
POTTERY.

Difficulties
meeting the
manufac-
ture of
Italian ma-
jolica.

as possible, the majolica ware of Urbino and Castel Durante. If we had a charge to make against the noble potter, it would be that vigour and delicacy are both a little wanting in his pieces, which have this in common, that they all appear to be painted by the same hand. The Marquis has also succeeded in his lustres, which, if they are not as splendid as those of Maestro Georgio, are, at all events very superior to anything that has hitherto been done in this line. Now that he has so amply proved that the old masters have no more secrets for him, it would be interesting to see him devote his experience to the production of original pieces, so that he would only have to sign his own name. The principles upon which this manufacture is based consist in painting with metallic colours upon a biscuit, which, being naturally coloured is, first of all, whitened by means of a thin layer of a hard stanniferous preparation; then, after the completion of the painting, it receives a thin smear of transparent glaze, so that the painting is placed between two layers of vitreous composition, the stanniferous preparation being the harder of the two. The degree of heat necessary to vitrify the whole has to be regulated with the greatest care, because if too low the painting will appear hard, dry, and deficient in richness of tone; if too high, the colours lose their strength and brilliancy. The point to be attained is when, without losing their force, the colours are sufficiently fused to blend slightly one into the other, and remove all hardness of outline. As this process requires so much manipulative skill and tact, the natural endeavour amongst manufacturers was, as soon as they were acquainted with a way of making an enamel at once opaque and soft, to coat their biscuit with this single preparation, and so realise their aim to a nearer approach to porcelain. But then this occurs, that in increasing the opacity of the enamel the richness and vigour of the colouring are lost. It is only necessary to compare a piece of early majolica, of Faenza more especially, with those of a later period, to be convinced of this; it will be at once apparent that the richness of the tints is in inverse proportion to the amount of tin mixed in the enamel, or, in other words, to the opacity. Hence a reason why from the second part of the seventeenth century the Italian majolica ware was already but a pale reflection of its predecessors, that in Holland they should produce what we call delft ware, and more especially faïence in France.

Modern
attempts to
its repro-
duction.

It is to the reproduction of decorative faïence, coated with opaque enamels that the greater part of the Parisian potters have applied themselves. It must be owned that they are

MR.
ARNOUX ON
POTTERY.

not all fortunate in their selections, and several limit their efforts to imitating the faïence of Rouen, which offers little but what is inferior in the way of decoration. The difficulty in producing really artistic faïence lies in executing the painting upon the stanniferous raw enamel—that is, upon a pulverized surface, which the action of heat has not yet caused to adhere to the biscuit. It can be imagined what dexterity of hand is needful to enable the artist to paint upon a surface so movable decorations which the least touch of the finger is able to destroy, and what amount of practice he must possess to take into account the value of his tints, as this kind of painting, although force is one of its chief merits, looks, before being fired, like a fresco nearly effaced. Amongst those who have most devoted themselves to it is Mr. Pinhart. He shows his process by exhibiting a painted plaque, only half of which has been fired, the other half remaining in the unfired state; but his colouring is rather poor, and if he excels in making copies in blue monochrome from known engravings, it is chiefly owing to patient industry. We prefer, in spite of an apparent roughness of execution, Mr. Lorin, of Bourg-la-Reine; but the charming landscapes of Mr. Michel Bouquet strike us most; they are shown amongst the productions of Messrs. Genlis and Rhuddart, and in the galleries of the second group, where he has a beautiful series of plaques. Painting upon the unfired enamel has never before had such an intelligent interpreter, and it is by the vigour, harmony, and variety in the choice of his subjects, that Mr. Bouquet, who is besides a very clever painter, has succeeded in placing himself far before all his competitors. He is not the only talented painter who has abandoned the practice of oil for the seductions of ceramic art. A glance at the exhibition of Mr. Deck will convince us of this. Here we find works signed by Messrs. Ranvier, Anker, Gluck, Ehrmann, and Legrain, artists who know how to unite graceful and elegant design with a fine feeling for colour. We should state that they have been most efficiently assisted by Mr. Deck, who, having carefully studied the Persian ware, placed the result of his investigations at their disposal. To understand this ware, we must explain that the Persians employed, and still employ, in the preparation of the paste or body a coarse sandy clay, which they cover with a thin layer of a finer composition, but containing an equal proportion of sand, already rendered alkaline by the presence of the nitrates of soda and potash, which are found abundantly in the salt plains of Persia. It is to these alkaline silicates combining with the oxides of copper, cobalt, and manganese that the

Mr. Pinhart.

Mr. Lorin.
Mr. Michel
Bouquet.

Mr. Deck.

his imita-
tion of Per-
sian ware.

MR.
ARNOUX ON
POTTERY.

beautiful colours are due; and after the ware has been recoated with a transparent glaze, equally alkaline, it is submitted to the fire. The colours will be of increased beauty in proportion as the amount of sand used abounds in the clay.

Mr. Deck's
exhibition
particularly
noticed.

This manufacture dates from high antiquity. The walls and vaults of the ancient mosques of Persia, Scinde, and a great part of India were covered with tiles made upon this principle, and certainly the same effect could not be produced by any other mode of ceramic decoration. We recommend an inspection of the faïence of Mr. Deck, because it forms the leading feature of French faïence in the Exhibition. His chief artist, Mr. Ranvier, excels in painting idyllic subjects. He does not hesitate, in order to give more relief to his figures, to slightly emboss them, colouring them afterwards with delicacy, as was the practice at the manufactory of Capo di Monti. It is with regret that we introduce here this name of Capo di Monti, for nothing can less resemble its productions than the paintings of Mr. Ranvier. Mr. Gluck paints for the most part figures in the mediæval style; his dish with a knight in full armour, mounted on a black horse, coming out from a deep greenish-blue background, is perhaps the most beautiful piece of colour in the Exhibition. Mr. Anker also paints mediæval figures, but he has besides two dishes which are gems. One represents a girl in a violet dress spinning; the other a young woman, seated upon her bed, taking a cup of tea. Only genuine artists could possibly obtain results such as these, therefore we need not be astonished at the prices asked and freely given, prices which would appear fabulous to those who content themselves with a hasty and superficial look. We are, unfortunately, far from the time when, according to Picolo Passo, majolica dishes were painted at Castel Durante for a ducat and six lire the 100, that is to say, for a sum not exceeding 5s. of our money. At the present day cheap things can only be produced by machinery, and to speak of machinery means to speak of the absence of expression, feeling, and art. Mr. Adalbert de Beaumont, who has been in the East, and gathered there some valuable materials, is also much engaged in the reproduction of Persian ware, and it is under his superintendence that Mr. Collinot has executed an elegant pavilion or summer house, thoroughly successful as a whole. The composition of the portion forming the façade is particularly happy; but we must add that Mr. Collinot has only applied the Persian process in one of the panels on the left, which is the richest in effect, and that in the other parts, as well as in his vases, whilst keeping to the Persian style, he

Mr. Adalbert
de Beau-
mont.

has adopted the use of opaque coloured enamels; this causes his productions to look less transparent than those of Mr. Deck. The rest of the best specimens of oriental decoration in pottery are placed outside in the different eastern pavilions, and in the little mosque situated in the south-west part of the garden. We could not help expressing the wish that similar things were made in the west, a wish realized as soon as entertained, for we learned since that they had been manufactured at Paris by Messrs. Flandrin and Parvillée, of the Quay Bourbon.

MR.
ARNOUX ON
POTTERY.

Let us state here that it was the sensation created in 1855 at Paris by the exhibition of Messrs. Minton & Co.'s majolica which has given the impetus to, and developed the production of, all this art faïence. Messrs. Minton & Co., without rivals in England for important works of majolica, have known how to maintain their superiority in France, which they provide to-day with a large part of this special manufacture. We must observe that, if the artistic French faïence is well ornamented, it leaves much to be desired in quality, and we can cite in support all their faïence of the Palissy description, that of Deck, and of the Sèvres manufacture.

Messrs.
Minton the
first to re-
produce
artistic ma-
jolica ware.

The Minton majolica, on the contrary, is very dense, of a close texture—qualities to which is added great brilliancy of colour. It would take too long to describe the processes of Messrs. Minton, because they combine upon their majolica different sorts of transparent and opaque enamels, and because their painters work sometimes in the Italian method, sometimes upon the opaque-fired enamel, and again sometimes by a process of Messrs. Minton's invention, which consists in painting upon the naturally coloured majolica biscuit, without its being previously prepared, taking advantage of the colour of the biscuit to supply the foundation-colour of all the figures, afterwards covering the painting with a rich coat of transparent glaze. Such is the large ewer representing the gods, after Polidoro Caravaggio; and the large vase representing a boar hunting, after Rubens, the only specimens of this kind of painting which, in consequence of the very limited space allotted to them, they have been allowed to exhibit. The companion vase to the last painted in blue, and representing the Rape of the Sabines, may be also considered as one of the best productions of this firm, and we are glad to hear that both have found their place in the Kensington Museum. But it is particularly by their garden-pots, flower-vases, and garden-seats, many of which are dispersed about the gardens, that Messrs. Minton have made their majolica so well known.

MR.
ARNOUX ON
POTTERY.

Ceramic
imitations
of Limoges
enamel.

Messrs.
Josiah
Wedgwood
& Sons.

M. de Mol.

Earthen-
ware.

Importance
of this
manufac-
ture for
England.

Until now the imitations of Limoges enamels were made upon porcelain, but those of Messrs. Minton, although presenting a very rich and highly-finished appearance, are nevertheless executed on black earthenware, with a glaze so soft that, when melted by the action of the fire, the white enamel employed to form the figures and ornaments sinks into it, and is so well incorporated that, after cooling, it acquires all the qualities of old Limoges enamels on copper. What we now remark applies rather to the process than to the style of decoration, for Messrs. Minton, as much in their faïence as in their porcelain, and in the general arrangement of their models, avoid copying, and especially endeavour to be original. Messrs. Josiah Wedgwood and Sons only employ for their artistic faïence one material—their old cream-colour ware—and have intrusted its decoration to Mr. Lessore. If, in having recourse to this artist, their intention was to create as great a contrast as possible to the correct, chaste, and classical appearance of their jasper ware, they have perfectly succeeded, and we have before us proof that extremes can meet and do very well together. Mr. Lessore is eminent at the present time as a colourist, and is sufficiently known in England to make it needless for us to descant upon the spirit displayed in his works, and what we could call his impetuous execution; it is a talent which, less than any other person, we would wish to contest, and if he repeats himself, or sometimes gives a look a little slovenly, we must not forget that in manufactures we have to bow to the demands of commerce, and are not obliged to make everything a work of art. M. de Mol, of Brussels, has endeavoured to follow in his steps, but as generally happens in such cases, he has only exaggerated the defects without having the qualities. His colouring is dull, and his paintings require a touch from Mr. Lessore to give them the life and point they are deficient in. Messrs. Wedgwood exhibit also some faïence, which, to be understood, we will call Palissy, but which is different in this particular—that the coloured glazes are applied upon a white biscuit which gives them great brilliancy when blended together.

As Josiah Wedgwood is justly considered the chief promoter of that which constitutes at the present time the principal industry and glory of Staffordshire, this name affords us an opportunity to pass from artistic faïence to that called earthenware. Here we must draw a parallel between this industry in France and England.

In Great Britain the ceramic manufacture is carried on by a great number of manufacturers, upwards of 250, located

for the most part in North Staffordshire; about four-fifths of this number devote themselves to making faïence, and, judging by the manufactories built during late years, and the steady increase of a population, which since the first census of 1738, has regularly doubled itself every 25 years, we should say that this industry is progressing rapidly. But, as on looking at the exportations since 1851, we see that in 15 years the value of the exportation of faïence, which then amounted to 1,122,571*l.*, has only reached in 1866 to 1,652,669*l.* which gives but 530,340*l.* total increase, or 44 per cent. on the whole amount, or an annual increase of 35,340*l.*, hardly 3 per cent., we are led to the conclusion that it is in the home trade that the surplus manufacture, which must be considerable, is absorbed. In France the number of manufactories of faïence for the same period has remained absolutely stationary. They are—Creil-Montereau, and Sarreque mines in the first rank; in the second, Gien, Choisi le Roi, and Bordeaux. Beyond these five establishments there may be a few of secondary importance, and not worth mentioning. But these five manufactories, particularly the two first, are carried on upon a very large scale, with considerable capital, and directed by great commercial intelligence. They have ever been the first to adopt all practical processes which would improve the quality and reduce the price of their earthenware. This earthenware, if it has not the density and resistance of ours, is very white and of a rich glaze. The exportation of French faïence is almost nothing.

MR.
ARNOUX ON
POTTERY.

French
earthenware
manufac-
tories

In both countries the faïence is made upon the same principles—that is to say, by using plastic clay whitened by silex and kaolin, and rendered denser by introducing a certain quantity of granite partially decomposed, which, coming from Cornwall, we call Cornish stone. We find, with reference to these materials, the advantage is in our favour, as our clays are finer and more abundant, to which must be added that we have better and cheaper fuel. It is also remarkable that such clever ornamentists as the French have not yet got into the style which we consider fittest for the decoration of earthenware; and we are very superior to them in the production of what we call our enamelled patterns. For that kind of earthenware we have excellent traditions and plenty of skilled workmen, and much time must elapse before our continental brethren can beat us in this field. The specimens of enamelled earthenware exhibited by Messrs. Minton, Copeland, Wedgwood, Brownfield, Pinder, and Bourne, and George Jones exemplify this amply; and these specimens may fairly be taken as only showing the normal state of their daily productions.

Advantage
in favour of
English
manufac-
turers.

MR.
ARNOUX ON
POTTERY.

—
Little pro-
gress made
by English
earthenware
in the
French
market.

Sarregue-
mines, and
Creil-Mon-
tereau.

Villeroi and
Boch.

It could well be asked—how is it, now, when we can introduce our best faïence into France—it being conceded we are superior both in quality and decoration—that our market there should be so limited? The principal reason lies, not in the small duty which is still imposed in France, nor in the extra charge for carriage, but in the competition it meets with in the hard porcelain. Upon this manufacture, which has become immensely developed in France, the whole productive energy of the French is centred. The number of its manufacturers have greatly increased of late years; and this porcelain, besides being used by the whole of the middle class—the class which would purchase our earthenware—is exported to an amount, in figures, almost as large as our exportation of faïence. We have then, this fact, that in England it is not our porcelain, but our faïence we export; whilst in France it is the reverse—the porcelain, not the faïence, that is sent out of the country. It seems as difficult to get the French to take our faïence as for them to accustom us to their hard porcelain. The Treaty of Commerce has taken such care to preserve the interests of each nation that, up to this time, neither have been able to gain any decided advantage upon the other. Probably the course of time will modify this; but at present, the exchange between the two nations is very limited, and chiefly in fancy articles.

The manufactories of Sarreguemines and Creil-Montereau show us little of what constitutes the basis of their commerce, but a great deal of artistic faïence. Mr. Gouvion, a clever artist of Paris, has undertaken to decorate the earthenware of Creil-Montereau, and Messrs. Sabourin, Langlois, and Mussill that of Sarreguemines. We must, in justice, admit that much of their faïence, having a softer enamel than the hard porcelain, incorporates the colours better, and has a more pleasing appearance to the eye than, as a rule, is the case with their pretentious rival. This branch of industry—namely, the decoration, which is very considerable, occupying a great number of hands in Paris—is entirely distinct from making the ware itself, and as can be conceived, offers vast facilities to the manufacturer desirous of presenting a show without being obliged to maintain in a permanent manner, at considerable cost, a painting and gilding establishment. In England this trade of decoration does not exist; or if it does, it is quite in its infancy.

Let us finish this review of faïence by mentioning Messrs. Villeroi and Boch, who have their manufactory at Mettlach, in the Rhenish provinces in Prussia, and supply nearly all Germany with a very good faïence, sold at prices which prevent any foreign manufacturers competing with them. It is, we believe, the largest manufactory which exists, and it

employs at the present time several thousand workmen, either at Mettlach or at Mauburge, which lies on the French side of the frontier, and is specially set apart for the manufacture of tiles.

MR.
ARNOUX ON
POTTERY.

Having examined pottery of a porous body, we must now go to that of vitreous texture—that is to say, porcelain biscuit, and porcelain itself. There is no natural clay or mixture of clays which, being submitted to the action of fire, for a sufficient time does not lose its porous nature, and acquire a degree of vitrification, which, for the same clay, will be in proportion to the heat applied. All clays have in them a natural flux. In the inferior sort, this is lime and the metallic oxides, oxides of iron chiefly; in the superior sort, which are the clays arising from the decomposition of felspar and granite, it is a very small amount of potash or soda. But we can regulate at will the degree of vitrification of one or the other by hardening the first by the addition of silica and kaolin well washed, and softening the second by felspar, granite, salts of lime, barytes, and the metallic oxides which furnish the elements of colour. In general, for pottery which is intended to remain at the biscuit stage, and which comprises stoneware, jasper, and statuary biscuit, the degree of vitrification is regulated in such a way that the pieces becoming impermeable to liquids acquire a certain transparency, and are vitrified, though not enough to destroy the sharpness of the modelling, and still less to lose the shapes. To get this exact degree, there are some difficulties to be met with. The principal is a great diminution of size or shrinkage the pieces undergo, which is not less than one-fifth of the original bulk. Each part, therefore, to the extent that it lies out of the perpendicular and centre of gravity will require to be propped up by means of supports made of the same material. This demands considerable experience on the part of those who prepare the pieces for the oven. In hard porcelain biscuits, which have but little transparency, this difficulty is less experienced; but for parian, such as Messrs. Minton's, or biscuit statuary, such as Messrs. Copeland's, it is very great, these manufacturers aiming always to give their productions the transparency of marble. The grand dessert-service, made by Messrs. Copeland and Sons for the Prince of Wales, shows what can be done in biscuit statuary in the way of ornament for our tables. We have noticed a great variety of groups and figures executed by these able manufacturers, who have acquired a reputation for works of this sort. We find in Messrs. Minton and Co.'s exhibition their parian biscuit combined with porcelain in the greater part of their centre-

Second
group.
Vitrified
bodies.

Messrs.
Copeland's
statuary
biscuit.

MR.
ARNOUX ON
POTTERY.

Messrs. Min-
ton's parian
in combina-
tion with
china.

pieces and compotiers; the parian being used for figures and those parts which bring out the delicacy of the model. The strongest objection we have to make against using these biscuits is the difficulty of keeping them clean; and it is to obviate this that Messrs. Minton have brought out a new kind of glazed parian of celadon colour. The celadon being only used partially as a ground for the figures and ornaments, which are left in white, this forms one of the most interesting features of their exhibition. Amongst the most successful pieces are two vases representing the vintage and the harvest, the frieze of which, in soft paste, has been painted in monochrome rose by one of their most eminent china-painters, Mr. Yahn.

Messrs.
Wedgwood's
jasper.

The manufacture of jasper, which has so much contributed to the fame of the Wedgwoods, is represented by them alone; and who would venture to compete with this celebrated firm when to their long practice in its production are to be added all the treasures of Flaxman? Their great chimneypiece in Derbyshire alabaster is ornamented with plaques of jasper of sage colour, and indicates how this material may be adapted to architectural decoration. But, in the furniture department, Messrs. Lamb, Crace, and Wright and Mansfield, show us a more judicious use, and that it gains greatly by being more sparingly employed. Everyone will admire the perfection of the jasper in their oval jardinière supported by two female figures, in the numerous vases exhibited, and still more in the lesser pieces amongst which we must limit ourselves to point out the small breakfast set purchased by the Emperor. The Carrara biscuit of Messrs. Villeroy and Boch presents, in their vases and larger figures, a texture coarser than parian or jasper. Still, this material seems extraordinarily hard, and can be admirably moulded, reproducing all the delicacy of the model with wonderful precision.

Carrara
biscuit.

Porcelain,
hard and
soft.

We have now reached porcelain, which we consider the most perfect production of the potter's art. There are two kinds—hard, the true porcelain, the eldest, which is that of the Chinese and the Japanese, of very simple composition; and soft porcelain, an invention of the last century, in which transparency, the characteristic of porcelain, is obtained by artificial means. We all know that the Italians, Germans, and French, from its first introduction into Europe, in the sixteenth century, by the Portuguese, tried to reproduce the porcelain of China. These researches had a double result—first, the discovery, by Bottger, of materials and processes similar to those of the Chinese; and in the second place, the creation of a new kind of porcelain having qualities and

properties entirely distinct from the former. For a long period, there was a kind of antagonism between the two; in reality, it has always existed since the invention of the soft porcelain, each paste having had its supporters and detractors, and public opinion being by turns in favour of first one and then the other. It was the old fable of the iron and earthen pots. But, at the present day all amateurs are agreed upon the superiority of the soft when porcelain has to be coloured or painted. With our neighbours it is a custom of some, after highly praising our faïence, our jasper, or our majolica, to add, "but as to porcelain, you cannot touch it." This is rather severe for the English, accustomed to think so much of their Chelsea, Worcester, Derby, and modern porcelain. Without weighing the truth of this assertion, we are forced to admit that—our soft or English porcelain being only represented at Paris by Messrs. Minton and Copeland, whilst our neighbours are sufficiently numerous to fill two large courts—we do not shine in the quantity; but if we desire to judge the artistic quality of the two porcelains we shall have to look at them twice.

The three great seats of the manufacture of hard porcelain are China and Japan, Germany, and France. Putting on one side China and Japan, which we have only visited in reading by our fireside translations by M. Stanislas Julien and extracts from Père d'Entrecolles, France furnishes the largest amount of hard porcelain, and it is there also that it is best manufactured. France is highly favoured for its production from the quarries of kaolin, which abound in the centre and south. This material suffices, without any addition, to constitute the body: it is white, easy to work, and takes, in firing, a fine transparency. The glaze, which is fired at the same time as the paste, is also entirely composed from felspathic rocks, and vitrifies on the surface by the sole intensity of the heat required in the firing. Such a product presents, after cooling, great consistency; and the hardness of this glaze will defy the best tempered steel instruments. But defects arise from the very excess of these qualities. This hardness leaves little resource for decoration, the fine colours for grounds are banished, and the painting unincorporated into the glaze lies upon the surface, and looks hard and unfinished. This is so thoroughly acknowledged, that the Paris decorators now often prefer to paint upon French cream-colour ware instead of porcelain.

France the
largest and
best pro-
ducer of
hard porce-
lain.

The manufacture of soft porcelain has always been limited, for it is the most difficult of all pottery. Its inventors, persuaded that Chinese porcelain was a kind of glass, persisted in composing a paste of the same ingredients. Sand,

Difficulties
attending
the manu-
facture of
soft porce-
lain.

MR.
ARNOUX ON
POTTERY.

Its advantages.

lime, and some alkaline materials were, therefore, vitrified in the proportion considered desirable to give a white, half-translucent substance. But as, after being ground, it had not the least plasticity and could not be worked, they added as small a quantity as possible of the calcareous earth found in the plaster quarries in the neighbourhood of Paris, so as not to injure the whiteness or transparency. We cannot describe here all the difficulties that the manipulation of such a mixture presented. It could neither be thrown, nor pressed into moulds in the ordinary way; and the shapes were got by casting it in thick plaster moulds, and carefully turning and finishing by hand afterwards. Moreover, as in the process of firing this porcelain, so properly called *pâte tendre*, the pieces were very apt to sink and lose their shape, the way of propping them was of the utmost importance, but when the biscuit stage was safely attained, the rest was comparatively easy. From its composition, this biscuit had the greatest affinity for combination with the vitreous mixture forming the glaze, and the result was that this glaze, not being hardened by the biscuit on which it had been melted retained all its softness, and so thoroughly incorporated the colours of the painting that, after firing, they looked sunk into it. An equal advantage was that the alkaline nature of the biscuit and the low temperature required enabled those soft and beautiful ground colours to be used which are not to be met with on any other pottery; the green, made from copper, of an unequalled transparency; the turquoise, so attractive to the eye that a single piece placed in a room seemed to take all the light to itself; the bleu-de-roi, so well named from its richness; and that warm, delicate colour, the rose du Barry. We purposely mentioned the low heat required to incorporate the colours with the glaze, because the experienced potter knows their richness decreases with rise of temperature; and this is the reason why, for grounds in hard porcelain, hardly more than two colours can be depended upon—the blue from cobalt, and the opaque, heavy-looking green from chrome.

Why its manufacture was discontinued.

With these great advantages for decoration, with the indemnity afforded against all losses by the patronage of kings, backed with the purse of the French nation, it might be asked how it was that the production of the soft paste should have been interrupted at Sèvres for almost half a century. We will try in a few words to explain the reasons.

The manufactory of Sèvres ceased to produce the soft paste in 1804, several circumstances contributing to a suppression so much to be regretted. In spite of the discovery of soft porcelain, investigations into the nature

of hard porcelain had never been discontinued. The secret of its manufacture was known at the Royal manufactory of Saxony, but every precaution taken against its being divulged. The Royal manufactory of France, founded at Vincennes in 1745, and removed to Sèvres in 1753, had always pursued these researches, and the first success dates in 1768. From 1753 to 1768, therefore, a period of 15 years, soft porcelain was exclusively produced at Sèvres. Starting from 1762 the two were produced together, the directors inclining more to the one or the other, according to their tastes, but at the same time developing the production of those groups of figures in biscuits, called Sèvres biscuits, which are all made in hard porcelain. The French Revolution struck a severe blow to the manufacture of soft paste. By the fall of the Crown, the emigration of the nobility, and sale of their lands and property, and by the wars of the revolution and the empire, French society was completely overturned. To the old nobility succeeded one whose title had been conquered on the battle-field. A manufacture which appealed to the delicate tastes of a refined aristocracy ceased to be appreciated, and by degrees attention was diverted from a complicated and costly manufacture to one comparatively easy, capable of producing larger pieces, and which offered to the artist-painter the advantage of being able to estimate during the execution of his work the real value of the tints he employed. To this a circumstance, apparently insignificant, also contributed to some extent. About 1804 the person who presided over the mixture of the soft paste died, followed a few months afterwards by the head fireman. These vacancies in his staff confirmed Mr. Brogniart in his resolution to suppress entirely the manufacture of soft porcelain, and give his attention wholly to the hard. Mr. Brogniart, certainly the most eminent and learned of all who have managed the Sèvres manufactory (we do not speak of the living), cannot be blamed for this decision, which was in accordance with the tastes of the time. Hard porcelain promised to become what it really now is, a national pottery—a source of wealth to many departments, and, realising for France what earthenware did for England, form an important article of exportation. We should, besides, be less inclined to censure one who, in our youth, had honoured us with his friendship, as towards the end of his career he was one of the first to recognise the mistake he had committed. But the old staff has disappeared, with its traditions and experience; he felt himself too old to undertake so great a work, and it was to his pupil and successor that he recommended the resump-

MR.
ARNOUX ON
POTTERY.

MR.
ARNOUX ON
POTTERY.

It is revived
by M. Ebel-
men.

Assisted by
M. Rio-
creux.

Sèvres soft
porcelain or
pâte tendre.

Sèvres hard
porcelain.

tion of the studies necessary to reach this end. Mr. Ebelmen, who succeeded him in 1847, reproduced the *pâte tendre* during the four years of his management, but did not prepare the body of the soft paste he used, owing to a singular fact. In 1804 Mr. Brogniart requiring the cellar where the clay for the soft paste was stored decided to have it thrown away. The order was received by an intelligent man, who put it aside in some covered tanks, where it remained unnoticed for 45 years, till Mr. Ebelmen manifested the wish to revive the old *pâte tendre*. It was then Mr. Riocreux revealed to him the existence of his hidden treasure. This unexpected help, besides saving the time spent in experiments, and supplying material for immediate use, gave, what was more important, a standard for all the new mixtures. Since then Sèvres has continued to produce the soft paste, but in less quantity than could be wished.

Amongst the most remarkable pieces of Sèvres *pâte tendre* are the fine vases, all of the same shape, painted with cattle scenes by Mr. Van Mark. This distinguished artist, who follows close upon Troyon and Rosa Bonheur, gives a warmth and mellowness of tone to his painting, reached by none of his colleagues at the manufactory. These vases are the finest things Sèvres has to show us. Mr. Schilt, who enjoys the advantage over many of the Sèvres artists of only painting on the *pâte tendre*, has several vases decorated with a class of subjects called "Trianon." They are successful, although in a style Parisian decorators have somewhat abused. Those painted by Mr. Froment, well known by his paintings in violet monochrome, are less important than in former exhibitions. We regret this the more, being accustomed to consider him one of the most eminent of the many devoted to porcelain decoration. We looked again with pleasure upon a pair of small vases in his happiest manner, with subjects illustrative of wine and of water, which we had seen in London. He has also a pair of vases, representing the four elements, very original in composition.

The first thing which strikes us on entering the Sèvres Court is the immense number of vases in hard porcelain, by no means all of equal merit; and we remarked that the forms recently adopted are less beautiful than in 1851 and 1855, when Messrs. Dieterle and Klagmann gave their assistance to this establishment. Several vases are evidently only there to increase the number. Amongst the best are a large vase, from Dieterle, the figures painted by Mr. Roussel, with decorations by Mr. Avisse, and all those executed by Mr. Barryat. This artist has painted a pair after

a design by Mr. Hamon, where he has translated the ingenious idea of a young girl painting the wings of a butterfly. Mr. Barryat generally composes his own subjects, painting them in their several details, whether figures, flowers, or ornament. He has two pairs of vases on a green ground, one representing some children sleeping amongst poppies, the other illustrating fishing. Conventional decoration is, as a rule, treated with talent by Messrs. Richard and Goddé, whilst flowers have their interpreters in Messrs. Cabau, Bulot, and Barré. Indeed, Sèvres has at its disposal for painting in hard porcelain many clever hands, and if anything is to be regretted it is that they have not had a softer material to work upon.

MR.
ARNOUX ON
POTTERY.

But the principal feature in the Sèvres Court is the great number of vases in that hard porcelain called *pâte sur pâte*. For the last 15 years the manufactory has chiefly directed its exertions on its production, and, thanks to Mr. Gely, they have been crowned with perfect success. The name of *pâte sur pâte* explains sufficiently the process, which consists in staining the body of the hard porcelain in celadon or other colour, by the addition of a coloured mixture, of which oxide of chrome is generally the chief ingredient, and then, when the piece is still in the clay state, to paint or rather model upon it with a brush, using the white body of the porcelain as the pigment, and taking advantage of the transparency it will acquire when fired to produce an effect similar to that obtained in the Limoges enamels by working the semi-transparent enamel on a black ground. Consequently, the artist will increase the thickness of the white clay for the high lights, and decrease it where the colour of the ground is to be seen through. Much experience is required to calculate the effect, the white clay, before firing, being equally opaque in the thin as in the thick parts. Of course, any mistake is irremediable, as it can only be seen after the piece is fired. It was from studying the Chinese celadon that Mr. Ebelmen started this kind of porcelain. The colours used on account of the high degree of temperature are extremely limited. We have already mentioned that chrome was the foundation colour for all the grounds; to this must be added cobalt, nickel, and uranium, which are also used to stain the clays when some other tint is wanted in addition to the white. This scarcity gives a slight monotony to the general effect of the pieces, especially when so many are collected together, not improbably all that have been made for the last three or four years. Apparently, the most important, not the most difficult among the pieces, *pâte sur pâte*, exhibited in the Sèvres

Hard porcelain called
pâte sur
pâte.

Limoges
enamels
: effect

all
pieces

all
pieces

MR.
ARNOUX ON
POTTERY.

Court is the centrepiece of the large dessert service placed in the middle. It is composed of four reclining oriental figures representing the seasons, arranged round a plain oval basin, the whole being fixed in a stand of bronze gilt. The first impression is one of surprise; being so unlike what the eye has been used to, it is hard to determine whether to like it or not, and those greenish figures, with dresses of different shades of neutral tints, have certainly a strange look. Fortunately, there are some touches of gold here and there to relieve the whole. The composition is creditable to the modeller, Mr. Forgeot, who has also modelled the other pieces of the same set, but with less success, the pretension to quaintness being carried too far. We prefer his graceful etagère, in the form of a standing female figure, holding a ring of bronze gilt, in which are fitted four tazzas with cupids seated between. Amongst the best specimens we must also mention the tall bottles, with bulrushes and wild ducks, by Mr. Damouse; the oval jardinière, by Mr. Regnier; and, particularly, the fine vase of antique shape, painted by Mr. Solon, in which the effect of the different shades of white on the dark-greenish colour of the ground is exceedingly good.

Limoges
hard porce-
lain:

its recent
progresses.

Mr. Gibus.

Messrs. Pelliwuit, of Foëcy; Gibus, of Limoges; and Rosseau, of Paris, come very little behind Sèvres in the production of the *pâte sur pâte*; Mr. Gibus, in particular, whose exhibition of hard porcelain merits a special notice. Those who remember the style of art which prevailed in Limoges previous to 1855 will be much gratified by the progress made since. The manufacturers, wise enough to see that, unless they participated in the movement going on for the improvement of art applied to manufacture, they must lose ground, did the right thing in establishing at once, not only a school of art, but a ceramic museum. They have not had to wait long for the result; and should no further advance be made beyond the present one, still nothing will have to be regretted. After this long review, we cannot examine in detail the principal features of what is called the Groupe Limousin. But we select Mr. Gibus as the best in every respect for beauty of material, good models neatly manufactured, and lightness united to elegance of form in the small articles. We recommend our English throwers and turners to look at his thin cups, and likewise at those of Mr. Ardant, of the same town, who, by-the-by, has an excellent show of hard porcelain biscuit figures. Mr. Gibus has had the good taste to leave his vases in plain white, the only colour introduced being in the figures forming the handles, or supports, of the pieces; these are made in a body slightly

tinted in green or gray, and left in biscuit. This combination has a very good effect.

MR.
ARNOUX ON
POTTERY.

Mr. Macé, of Paris, has perfected as far as possible his chromo-lithographic process of decoration, and it requires close inspection to perceive that his porcelain is not painted by an experienced hand.

Mr. Macé.

The Marquis of Ginori, who seems bent upon sustaining alone the reputation of the old Italian manufactures, has a fine exhibition of porcelain, in imitation of the famous Capo di Monti. We have never been enthusiastic admirers of the original productions, which we consider in questionable taste, although they have been so much sought after by amateurs. But we can do no less than compliment the Marquis on the exact manner in which he has copied them. His great coffer, mounted in ebony—which measures at least 4 ft. by 3 ft., and is surmounted by a group of Bacchus and Ariadne—is, without doubt, the largest piece that has ever been made, and proves that the Marquis can cope with all difficulties. We should like to mention several of his vases, but must content ourselves with directing attention to his small coffer, also mounted in ebony. This will furnish a sufficient idea of his manufacture.

Italian hard
porcelain.

Capo di
Monti.

The events which took place in Saxony last year had, no doubt, their influence on the exhibition of the Meissen manufactory, since its very existence as a Royal manufactory was placed in jeopardy. We must hardly, therefore, feel astonished if we do not find it quite up to its proper level. Still, the pieces for decorative purposes from the cartoons by Schnorr, of Carolsfelt, and Professor Bendemann, professor at the School of Dresden, prove that M. Kuhn, the able manager, has exerted himself to maintain its position. Let us remark here that, in spite of the general falling off in the excellence of the German productions, no lack is shown of artistic resources; on the contrary, Saxony and Bavaria have a great many painters on porcelain of the first rank—we assert superior even to those we find in France. But they want two things in order to produce to better advantage: first, a softer material; and, secondly, more encouragement from the higher classes in Germany, who have not yet evinced much taste for finely-decorated porcelain.

German
porcelain.

The Meissen
manufac-
tory.

What we say about the porcelain of Saxony applies also to that of the Royal Manufactory of Berlin, though this is in advance of the other. In the large vases of Berlin porcelain a great difficulty has been avoided by producing them in biscuit. The forms do not fail in elegance, and this is illustrated by the large biscuit vase, on which is represented a group of Venus, Vulcan, and Paris. There is a series of five

The Royal
manufactory
of Berlin.

MR.
ARNOUX ON
POTTERY.

The Im-
perial manu-
factory of
St. Peters-
burgh.

English
porcelain.

Its qualities.

vases in the form of jars, also in biscuit, with subjects painted in brown upon a gray-coloured ground, representing scenes from the German epic of the Nibelungen. These vases are painted after designs by Professor Kolbe, brother of the late manager; we say late manager, for Councillor Kolbe, of the Royal Manufactory, died May 27th last. This series proves that the late lamented manager sought a style of decoration which had a German character, and that in this he was successful. We wish we could say as much for the Imperial Manufactory at St. Petersburg, but we have looked in vain for anything superior in form or colour to what we have seen in previous Exhibitions. The two large vases are well painted, but in a heavy and dull scale of colour. For the small pieces all we can say is, that they seem to have come from the atelier of a Parisian decorator. We cannot but consider this a mistake. Russia has a natural style of decoration—the Byzantine—which they practise with great success in their mural decorations, their jewellery, and in all their work in the precious metals; and we ask, why should they not keep to it, when it is as much adapted as any other style to meet the requirements of the ceramic art.

English porcelain is all that now remains for us to examine; this altogether differs from the hard porcelain and the *pâte tendre*, and in many instances combines the qualities of both. M. de Bettignies, of St. Amans-les-Eaux, where the manufacture of soft porcelain has never been discontinued from the last century, has furnished the Parisian trade with all the vases painted in imitation of old Sèvres, thus proving that it was possible to manufacture it commercially on a small scale. However, the difficulties to be overcome in making large pieces, and particularly articles for use, such as dishes, rendered the workmanship so expensive that the boldest of manufacturers would hesitate to make it the basis of his business. Fortunately, the introduction of phosphate of lime, which is obtained from bones, in the paste of the porcelain—a discovery essentially English—has supplied a means to obtain a fine transparency, and, without affording all the plasticity of the hard porcelain, it does not prevent the mixture being cast, moulded, or turned easily by the ordinary processes. The greatest advantage of porcelain bodies thus prepared with phosphate of lime is the power, not only to mix with the frits of the true *pâte tendre*, but also to admit the use of those glazes so admirably adapted for the painting, and of all the colours for grounds so much admired in the old Sèvres. Without doubt, if we inquire into the hardness of the material, its resistance to change of temperature and to the scratch of the knife, we must give

the palm to the hard porcelain, which we all agree is the one to stand wear. But then, fine porcelain is not intended to be handled roughly, or to be scratched, knocked about, or put in a kitchen stove. It is something worth caring for. At all events, the qualities of hard porcelain are not required for a vase, and the porcelain services of gentlemen are usually treated with more consideration than is bestowed on the crockery of an hotel or eating-house. Fortunately, in England it is not necessary to plead the cost of soft porcelain against the hard. It has been decided a long time ago, so we need not dwell longer on the subject.

MR.
ARNOUX ON
POTTERY.

Two firms only—the two which produce the greatest amount and the finest porcelain—come forward to sustain the reputation of England in the competition, Messrs. Minton and Co. and Messrs. Copeland and Sons, both of Stoke-on-Trent. We regret that the Worcester manufactory under the able superintendence of Mr. Binns has not joined them; nevertheless in the glass exhibition of Mr. Greene, of London, we found a small breakfast set on a gold ground, made by this manufactory for the Countess of Dudley, which we recommend to the inspection of all who like to see richness united to elegance and neat execution. The large quantity of superb vases boldly decorated with flowers, by Mr. Hurten, constitute the chief attraction of Messrs. Copeland's exhibition. Generally, the flower painting is very good in the English department, and quite equal to anything exhibited in the Sèvres Court. Messrs. Copeland's largest vase is a proof of it, though we prefer some of their smaller ones. They are exhibited in front of the large vestibule, and in one of their glass cases. But a large wine-cooler, decorated with grapes painted in a broad, masterly, and effective manner, by the same artist, is best of all. The specimens of bleu-de-Sèvres, richly gilt and exquisitely chased, are as good as any specimens of the old. Messrs. Copeland's exhibition, as a whole, gives the greatest credit to Mr. G. Eyre, their manager for the art department. For richness, certainly their productions cannot be beaten. Were we to make a remark, it would be that this richness is sometimes excessive, and that so much gold and labour are not absolutely necessary for excellence of effect.

The Worces-
ter manu-
factory.

Messrs.
Copeland.

In Messrs. Minton and Co.'s productions richness is made of secondary importance, their aim being rather at elegance and distinction. The centre pieces painted by Mr. Henk are, however, rich enough. But the best things in their glass cases are the many vases of soft porcelain with figure paintings. The largest pair, in bleu-de-roi, representing the toilet and birth of Venus, from original paintings by Francois

Messrs. Min-
ton & Co.

MR.
ARNOUX ON
POTTERY.

Boucher, exceed in size all other vases produced in the soft material. They have been very successfully painted by Messrs. Allen and Mitchell, the same artists who have executed the painting on an Italian pair of vases decorated with a frieze of young cupids playing in a picturesque landscape. The pair of large bottles of Indian shape, decorated with white flowers on a celadon ground, have been painted by Mr. Simpson.

The large Watteau vase, with four more pairs, have been painted with the most perfect success by Mr. Yahn, already named. These vases illustrate sufficiently the nature of the soft porcelain compared with a harder material. In none is there a single touch of the brush which has not sunk into the glaze in such a way as to produce the most limpid brilliancy and transparency in the shadows. This result, achieved by long experience and much expense, is now so well secured to this firm, that all their best vases and dessert services are executed in the soft material. Some exceptions have been taken to the extreme softness and transparency of the colours in Messrs. Minton and Co.'s productions; the rule adopted by these critics being that porcelain painting ought to look more like oil, and present a more opaque appearance. We might contest at length the new principles of these authorities if this was the proper place, but will simply say that, if porcelain painting is to have a character of its own, it must look like the best paintings on enamel. An inspection of the old Sèvres ware of the best period, and the works recently executed at the Imperial manufactory by Messrs. Van Mark, Schilt, and others, will prove that this claimed opacity cannot be found in any of them.

Good display of the English ceramic manufacture.

We must, in conclusion, say that, making allowance for the limited and extremely inconvenient space allotted to the productions of the North Staffordshire potteries, it is acknowledged that, on the whole, they form the principal feature in our English department; that the English porcelain especially has been most admirably represented by Messrs. Minton and Copeland, and that it is incontestible that these firms maintain their ground for excellence of material and beauty of decoration; and let us add that, although called on to compete with Royal and Imperial establishments, they, in connexion with Messrs. Wedgwood and Sons, and Mr. Brownfield, depending on their own resources, have spared neither time, talent, nor money to represent in a worthy and creditable manner, the ceramic trade of Great Britain.

REPORT on TERRA-COTTA.—(Class 65.)—By Mr. HENRY
COLE, C.B.

MR. COLE
ON TERRA-
COTTA.

THAT history repeats itself is shown by the extensive revival of the use of terra-cotta at the present time. Six thousand years ago earth baked, cooked, or burnt—terra-cotta—was common enough in Egypt, and was the building material of that people. It was used by the Greeks, by the Romans, and by various European countries in the middle ages; and in the Paris Exhibition, both inside and outside the main structure, proofs were afforded that modern Europe is largely reviving the use of terra-cotta.

1. Ancient
use of terra-
cotta.

In humid England, and especially in its smoky manufacturing towns, terra-cotta, if properly made, is far more durable than almost any building stone. It will bear much greater strains than many kinds of stone of equal proportions.* It is more durable than even ordinary granite, as may be seen on the lodge in Merrion-square, Dublin, which was built about 1786. The granite mouldings there are cut in stone from the Wicklow mountains; they are all worn away and rounded by the action of the rain, whilst Coade's terra-cottas, dated 1788, are as sharp as when they were first placed on this lodge. Again, at Sutton House, three miles from Guildford, in Surrey, where the entire structure is covered with ornamental terra-cottas, ornamented, possibly, by Torrigiano or his pupils about 1530, the terra-cottas, where they are properly compounded and baked, show the marks of the modelling tool as clearly as when they came from the maker's hands. The visitor to Paris has only to go to the Louvre and examine the Græco-Roman and Etruscan terra-cottas, collected by Campana and admirably arranged in the fine new room, to see how perfect terra-cotta remains after 2,000 years. The woodcut of the guard-house of the

2. Its quali-
ties as a
material of
construc-
tion

* The following are the facts in breaking a terra-cotta column made for the Horticultural Society's Gardens in February 1861.

The column consisted of five parts:—1, the base; 2, the shaft in three parts; and, 3, the capital. It was seven inches in diameter, $1\frac{1}{4}$ inches thickness of ring, giving 38·484 inch superficial area, and was filled with concrete.

It carried 5 tons 2 cwt. pressure without any effect.

At 16 tons 16 cwt. crack in cap opened with a loud report.

At 17 tons $18\frac{1}{4}$ cwt. upper part of the column broke down as in diagram (see next page).

At 18 tons $6\frac{1}{4}$ cwt., Bath stone abacus cracked and crack extended about 2" down cap.

MR. COLE
ON TERRA-
COTTA.

seventh cohort of Vigiles, or fire brigade, about A.D. 222, published in the *Illustrated London News* of 1867 (p. 269), furnished a fine illustration of the uses of this material sixteen centuries and a half since. It is desirable that our archæologists should prepare a chronological list of the existing illustrations of the use of terra-cotta from the earliest ages.

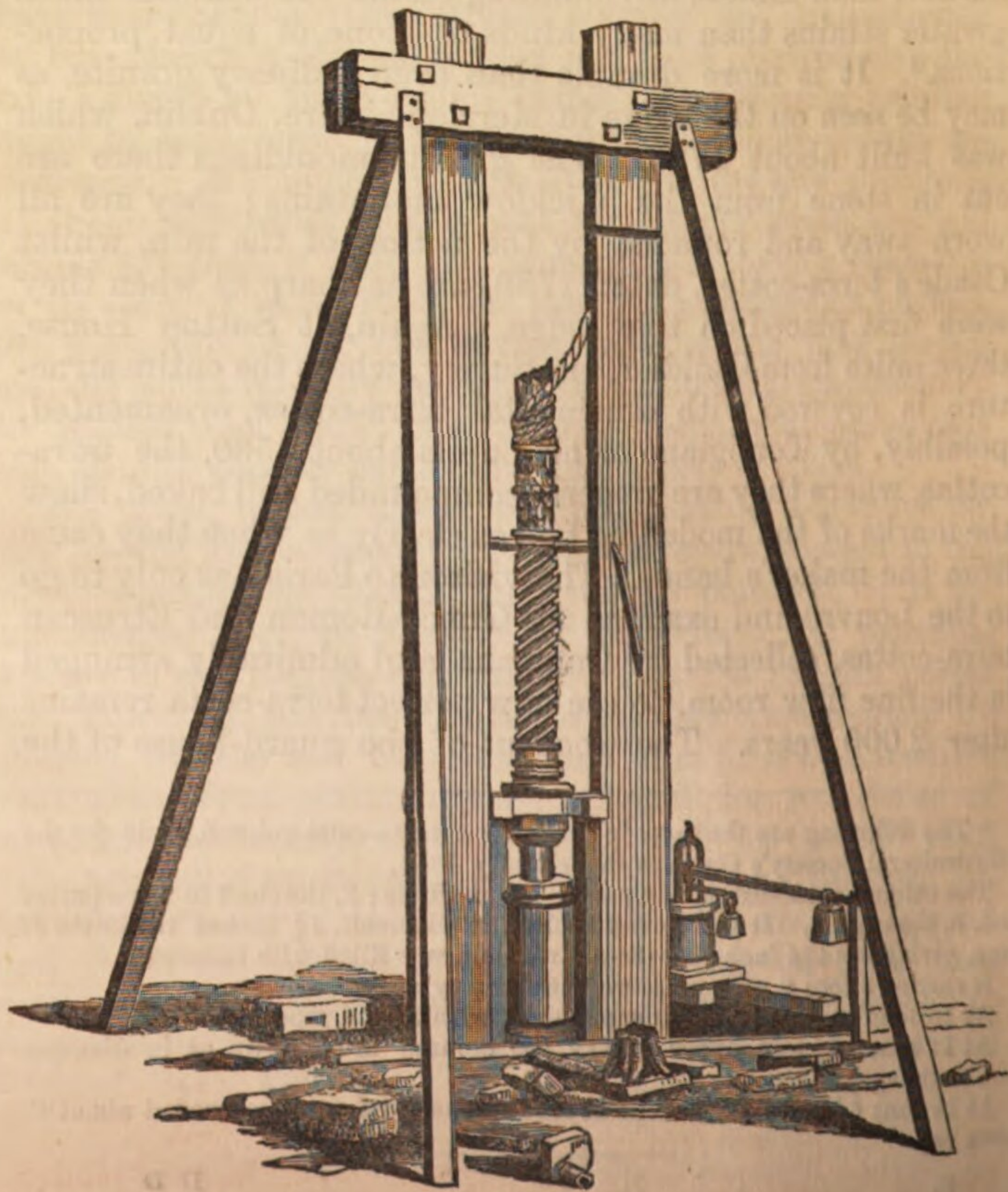
3. Clays
used in its
manufac-
ture.

The clays used in the manufacture of terra-cotta are intermediate in quality between those used for ordinary bricks and those employed for porcelain. They are more finely ground, and have a smaller proportion of impurities,

At 19 tons $2\frac{1}{4}$ cwt. piece of cap split off and crack in cap extended to 9".

At 20 tons $9\frac{1}{2}$ cwt. cap cracked in several places and the first crack extended a foot down the shaft.

(Signed) J. D. WAKEFORD,
Clerk of Works.



than the brick earths ; but are not so carefully ground and worked, nor so pure, as the porcelain clays. The red terra-cottas, however, like red bricks, derive their tint from the presence of oxide of iron, an impurity of which China clay contains hardly a trace. The goodness and durability of terra-cotta depend upon the completeness of its careful mixing or kneading, and on careful and hard burning. Many specimens in the Exhibition from the same factory are good or bad—are hard, and turn the knife's edge, or are soft—just in proportion to the extent of the firing they have received. The colour, too, is affected by the firing ; the beautiful tints, delicate as those of marbles, are produced by the gradations of the heat and mode of burning. Such variations of tint add greatly to the variety and interest of the material, but terra-cottas are not yet generally liked by architects.

FRANCE.

In taking a survey of some of the most remarkable of the numerous examples shown in the Exhibition, it will be convenient to begin with those of France. The inquirer was obliged to search for the terra-cottas, which were much scattered inside the building and outside in the park and in unexpected places. Terra-cottas formed part of Class 65 in the machinery group, and the juxtaposition with other objects was often illogical. In the midst of the machinery gallery were the productions of Emile Muller et Cie., à Ivry, Seine, France (32). They exhibited various architectural forms ; hollow bricks which were enamelled, also tiles and chimney pots enamelled ; and seem to be in much communication with the French architects. There was a finial designed by Violet Le Duc, the celebrated architect and archaeologist ; a head of a window by Davioud, architect ; a specimen from the Empress's pavilion, by Demimind ; a finial by Laval ; an architectural ornament from the Eglise Montrogue by Vaudremer ; together with terra-cottas and roofing tiles glazed in various colours. Garnaud, France (31), exhibited terra-cotta very white and monotonous in tint, but it seemed doubtful if it were well baked.

4. Examples
in French
section.

On the French side of the park, next to the shop of the Cashmere des Indes on one side and a specimen of a workman's house on the other, and directly opposite a stuffed ox, was the exhibition of Messrs. Virebent, frères et fils, à Toulouse, "manufacture de grès céramique, construction, ornamentation, statuaire et peintures émaillées" (France, Class 17, No. 16). They exhibited a boldly-

5. Examples
on French
side of park.

MR. COLE
ON TERRA-
COTTA.

modelled, gothic finial, upwards of 7 ft. high, made up of different pieces, with glazes of orange, green, and transparent brown. It was highly suggestive to architects for all styles. Messrs. Virebent's principal exhibit was in the form of a triangular chapel, of a hybrid Byzantine character, showing all the varieties of their various processes. Figures were painted in enamel upon the columns, and subjects were painted upon tiles used both on walls and as a pavement. The whole, although *bizarre* and to be avoided for direct imitation, was remarkably useful for its suggestiveness. It stood about 22 ft. high, and the cost was about 300*l*. Next, on the east side, was the collection of Boissimon, à Langeais, Indre et Loire, France (Class 17, Nos. 81 and 14). The roof of his temple was supported by enamelled pottery columns, moderate in price. He exhibited a great variety of vases and implements; cheap, but of doubtful taste; all, however, suggestive. On the north side was an enormous group in terra-cotta, by Gossin Frères, 57, Rue de la Roquette, Paris (France, Class 17, No. 95), representing a shipwreck. It was made up of several portions, and was an illustration of the employment of terra-cotta for large groups of sculpture. It was more remarkable for its accumulation of parts and size than anything else. Messrs. Gossin had other subjects scattered in various parts of the grounds, which, being painted, the character of the material could not be criticised. De Bay (Mdme.), 107, Rue d'Orléans, also in the park, in front of Rouze's Restaurant (France, Class 17, No. 76), exhibited varieties of architectural elements, together with vases and statues. Much of the material was excellently compounded and well baked. In the designs, group No. 2, were some skilful imitations of Persian columns by Collinot, as well as panels. His productions are artistic.

PRUSSIA.

6. Examples
in Prussian
section.

The terra-cotta of Prussia is excellent in material; hard, compact, well baked; but, according to German taste, is monotonous in colour. It made a considerable show. E. March (62), Charlottenberg bei Berlin, was the principal exhibitor. He admirably manufactures terra-cotta of a yellowish, stony tint, also of red earth, both hard and compact. He showed a monument, with the figure of Minerva, about 9 ft. high, and at the base were griffins, forming arms of seats. It was excellent work. Carl Friedenthal, Geissmannsdorf, Silesia (22), showed some

heraldic roundels, 5 ft. in diameter, of yellowish colour, striking for size and workmanship. A. Augustin, Laubau, Silesia (63), exhibited a remarkable pressed-brick construction, ornamented with red terra-cottas, which were very hard and well baked; but the joints between the bricks were half an inch wide, and were coloured like the brick; very unlike the best English brickwork, which is as closely jointed as possible. All these were in the machinery zone.

MR. COLE
ON TERRA-
COTTA.

WIRTEMBERG.

So was Staib-Wasserott, Ravensburg (2). — A large bracket about 3 ft. 6 in. in projection was a good specimen exhibited by him.

7. Wir-
temberg
section.

AUSTRIA.

To see the Viennese terra-cotta the visitor was obliged to leave the machinery gallery. Henry Drasche, Vienna (11), made a great show of terra-cotta in the south-west corner of the park facing the Ecole Militaire. The colour was not good, being of a reddish earthenware tint. The baking appeared to be capricious; in some cases thoroughly done, in others leaving the terra-cotta very soft and friable. Count Larisch, of Mönich Engin, zu Tolnisch Leuten, showed three or four samples of excellently manufactured and well baked terra-cotta in the park.

8. Austrian
section of
park.

SPAIN,

Exhibited a few samples of well made terra-cotta to which the jury gave an honourable mention. They were in the park.

9. Spanish
section of
park.

ITALY.

In the park, between the United States restaurants and the United States machinery, M. Boni, of Milan (36), erected a porta in his peculiar red-orange tinted terra-cotta, or it may be it was a recess and not a doorway. The front was divided into panels, as though it were a doorway. It was a large and imposing work, standing about 30 feet high, made up of many parts and many styles of ornament—busts, bas-reliefs, full-length statues, profiles, portraits, arabesques (which seemed to be borrowed from Munich), animals, griffins, &c.—all sharply modelled;

10. Porta
in Italian
section of
park.

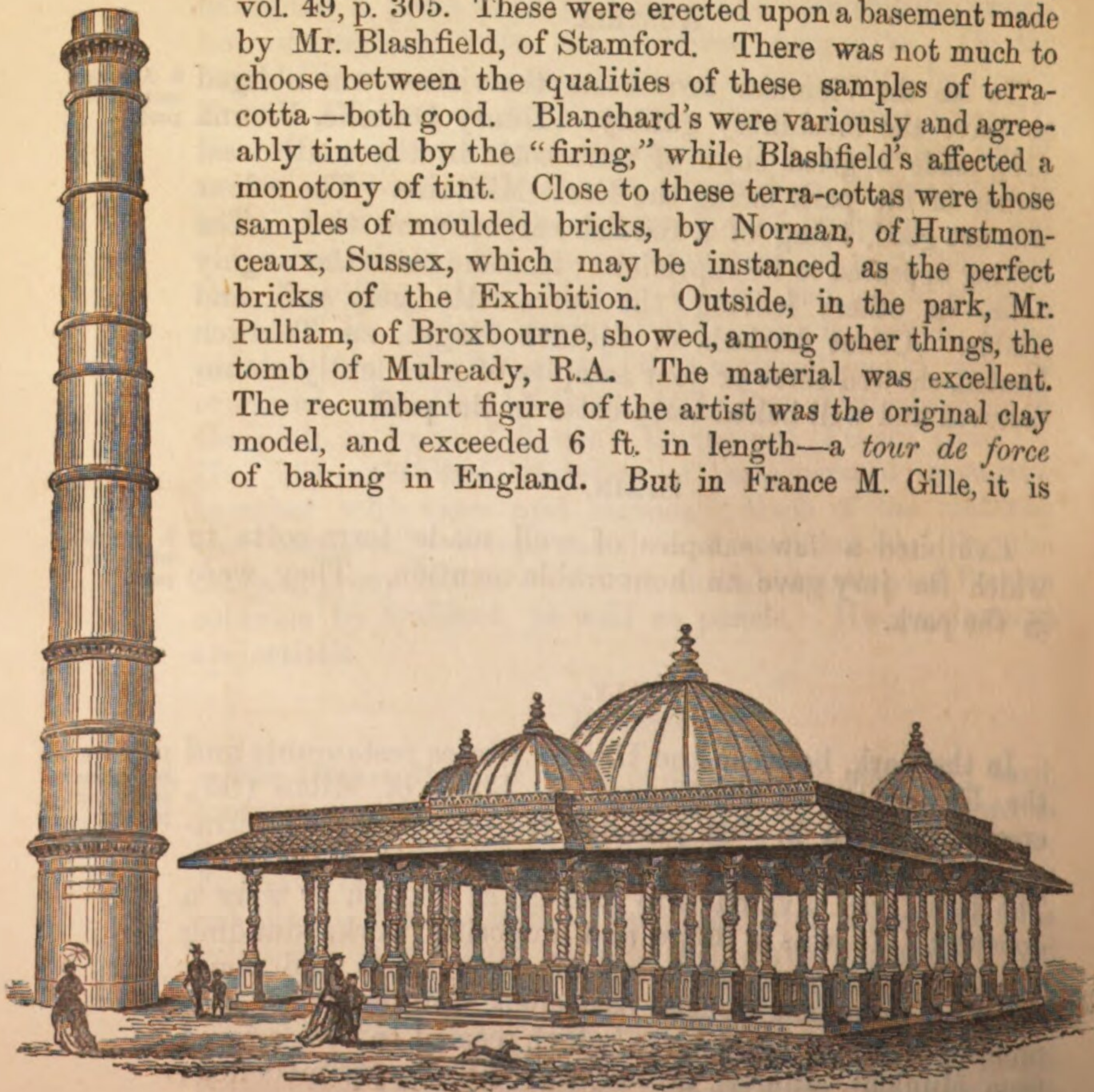
MR. COLE
ON TERRA-
COTTA.

but how different in style to the mediæval terra-cottas at Milan and Pavia, close to his works ! It was a curious salmagundi, probably brought together to show how ready M. Boni is to accommodate his material to everybody's taste. It did not seem to be very highly burned ; sufficiently, perhaps, for an Italian climate.

ENGLAND.

11. English
terra-cottas.

But the most extensive show of terra-cottas was made by the English. In the Machinery Gallery Messrs. Blanchard (successors to Messrs. Coade, in Blackfriars-road, where there has been a manufactory for about a hundred years) exhibited various architectural details, especially two noble columns of Godfrey Sykes's design, which have been engraved in the *Illustrated London News*, vol. 49, p. 305. These were erected upon a basement made by Mr. Blashfield, of Stamford. There was not much to choose between the qualities of these samples of terra-cotta—both good. Blanchard's were variously and agreeably tinted by the "firing," while Blashfield's affected a monotony of tint. Close to these terra-cottas were those samples of moulded bricks, by Norman, of Hurstmonceaux, Sussex, which may be instanced as the perfect bricks of the Exhibition. Outside, in the park, Mr. Pulham, of Broxbourne, showed, among other things, the tomb of Mulready, R.A. The material was excellent. The recumbent figure of the artist was the original clay model, and exceeded 6 ft. in length—a *tour de force* of baking in England. But in France M. Gille, it is

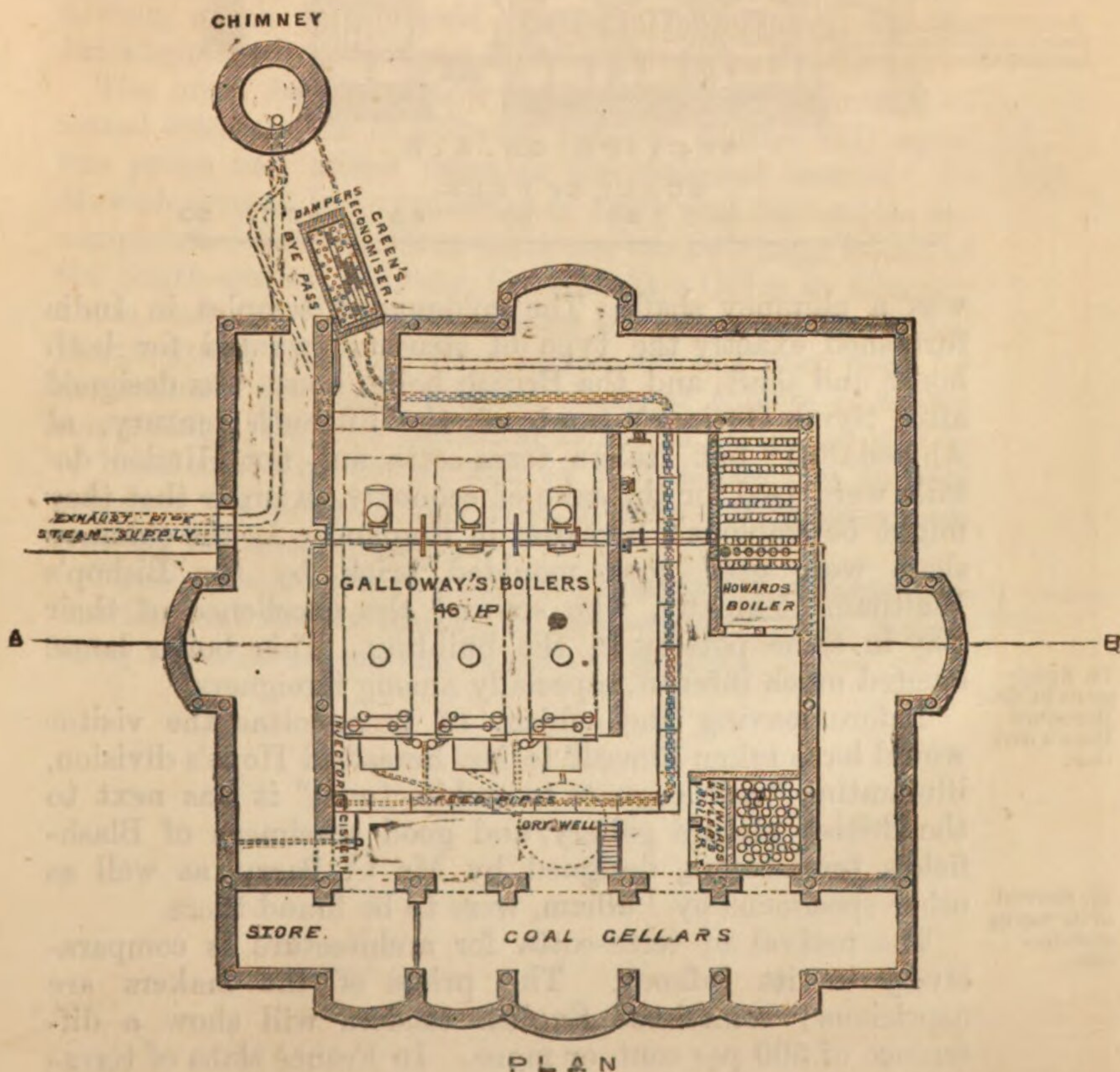


stated, has produced in one piece a figure above 7 ft. high, not in terra-cotta, but in hard porcelain, a feat which no English potter has yet attempted; this remarkable work was exhibited in one of the "carrefours" in the pottery group in France. A copy has been ordered by the South Kensington Museum.

MR. COLE
ON TERRA-
COTTA.

The most extensive use of terra-cotta, however, was in the boiler house for generating the steam necessary to move the British machinery; all the other boiler houses in the park were enclosed, and therefore so hot that no one but an engineer would go into them.

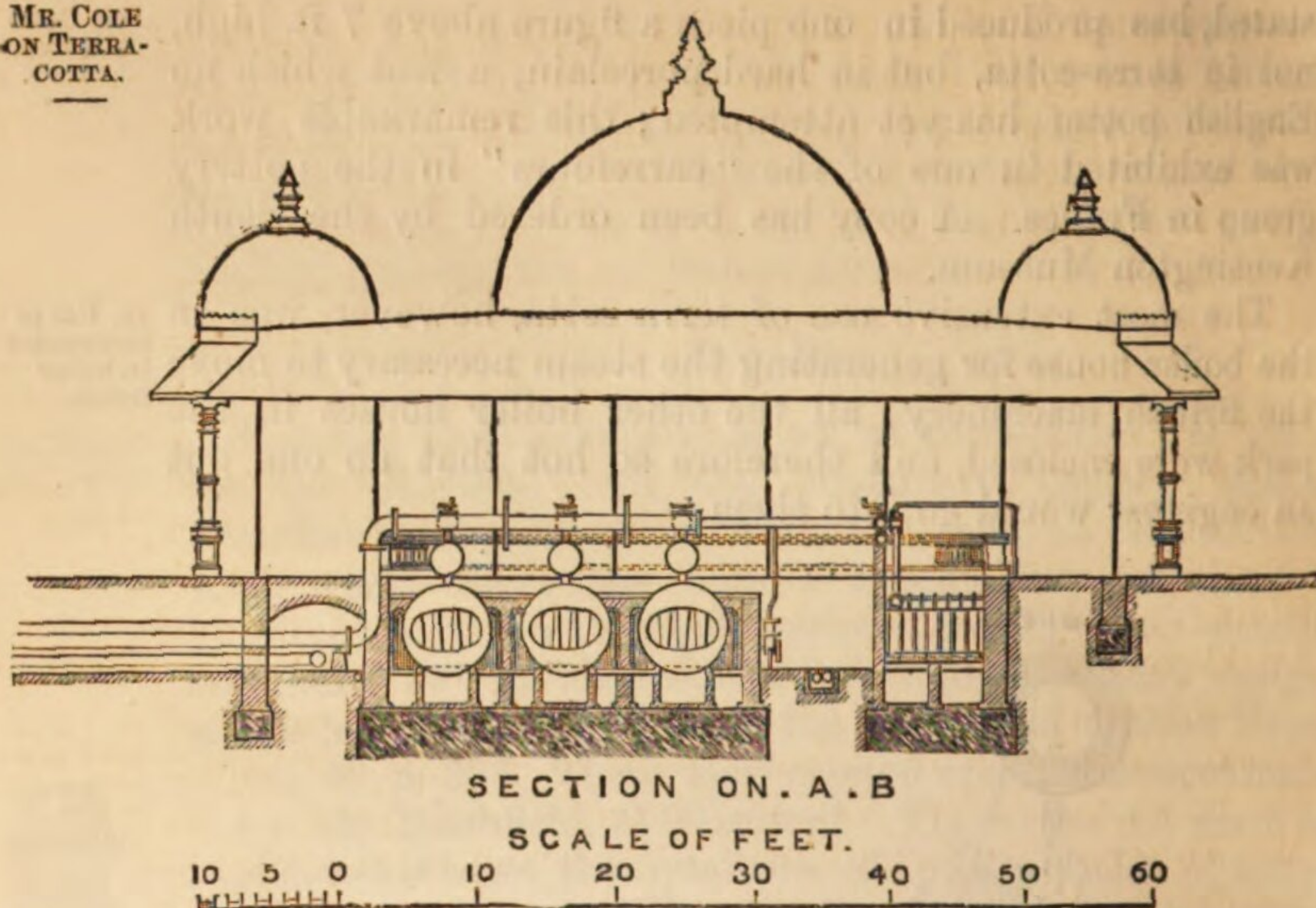
12. Use of
terra-cotta
in boiler
house.



The aim in the British boiler house was not merely to make the steam, but to show several varieties of boilers by different makers, and to attract the public to visit them, which was successfully accomplished. To do this an open, cool, and self-ventilating structure was necessary, and so

13. Boiler
house.

MR. COLE
ON TERRA-
COTTA.



was a chimney shaft. The colonnaded temples in India furnished exactly the type of structure wanted for both house and shaft, and the British boiler house was designed after Syud Oosman's tomb of the fifteenth century, at Ahmedabad; but Italian terra-cotta and not Hindoo details were used for the sake of economy, in order that they might be employed hereafter in England. In the chimney shaft were used good moulded brick by the Bishop's Waltham Company, who showed the excellence of their clay in some pottery in the building. This boiler house excited much interest, especially among foreigners.

14. Specimens in Mr. Beresford Hope's division.

Before leaving the subject of terra-cottas the visitor would have taken himself to Mr. Beresford Hope's division, illustrating "arts cognate to architecture;" it was next to the British picture gallery, and good specimens of Blashfield's terra-cottas, designed by Mr. C. Barry, as well as other specimens by Pulham, were to be found there.

15. Revival of its use in architecture.

The revival of terra-cotta for architecture is comparatively in its infancy. The prices of the makers are capricious; sometimes English tenders will show a difference of 300 per cent. or more. In France slabs of terra-cotta, glazed, about 2 ft. long by 18 in. wide, cost 5f.; in England they cost 18s. But in France a large majolica column would cost four times as much as the same column made by Messrs. Minton.

16. Price.

The price in London of ordinary terra-cotta facing for buildings with a bond of $4\frac{1}{2}$ in. and 9 in., that is to say,

with an average bond of $6\frac{3}{4}$ in., may be assumed to be from 3s. 4d. to 3s. 6d. per foot superficial. The price will vary somewhat, according to the intricacies of the ornament and also with the size of the blocks required. When coal and clay are both to be had at the site of the manufactory the work can of course be executed more cheaply than when they have to be brought from a distance, and it appears probable that a reduction of 40 per cent. may be eventually made.

MR. COLE
ON TERRA-
COTTA.
—

The expense of fixing the terra-cotta on a three-storied building may be assumed to be from 1s. to 1s. 2d. per foot superficial, including materials and hoisting, but not scaffolding, which as it would generally be required for the bricklayers' work need not therefore be specially erected.

17. Expense
of fixing.

The great buildings now contemplated or in course of actual construction in different parts of Europe will equalize prices and afford valuable international lessons. At Munich several large buildings in brick and terra-cotta are completed. So in London there are the two large hotels of the South-eastern Railway, the Sun Fire Office at Charing Cross, and the South Kensington Museum, and the Royal Horticultural Gardens, where terra-cotta has been used for decoration. At Berlin a great chemical college is nearly completed. The new cathedral at Berlin it is said will be of brick and terra-cotta; and so will be the new covered coliseum, the Royal Albert Hall of Arts and Sciences, now erecting at Kensington-gore.

18. Use of
brick and
terra-cotta
in large
buildings.

These are among the evidences which show that Egyptian, Grecian, and Roman history, in terra-cotta at least, is now being repeated among the nations of Europe.

19. Conclu-
sion.

REPORT ON CARPETS, TAPESTRY, and other STUFFS for FURNITURE.—(Class 18.)—By M. DIGBY WYATT, Esq., Architect, and Juror for Class 15.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

THERE are two distinct aspects under which all carpets present themselves generically—the one industrial, and the other artistic. The industrial aspect comprises the theory of manufacture, and the relations of the fabric to comfort, durability, and economy. The artistic aspect takes cognizance of the greater or less beauty of the design which adorns the carpet. That design may generally be regarded as falling into one of two categories—viz., firstly, into what the French call a “fond,” or unobtrusive basis, calculated to serve as a background, from which furniture may be satisfactorily detached; or, secondly, a picture complete in itself, and upon which the eye may rest with complacency, provided that the “ensemble” or whole effect of the design can be embraced from a single point of view. Such being the general outline of the analysis of the subject, as it presents itself to my mind, I propose to adopt its various headings as the skeleton upon which it may be well to hang the various remarks upon detail which will constitute the bulk of the present report.

General aspects of the subject—the industrial and the artistic; the former in relation to use, the latter to delight. Carpet design supplies either a background or a picture.

The above constitute the chief headings of this Report.

Beginning, then, with the industrial aspect of the subject, it will be found that in all countries the original and commonest description of carpet differs but little from the ordinary coarse woollen cloth of the nation. In the East, the cradle of carpet manufacture, the “suttringee,” or common cotton rug, or small carpet, is an “institution” throughout India, as not very long ago the “Kidderminster” was with us. The first fundamental improvement upon the simple weaving together of a cotton or woollen warp and weft consisted in the doubling in substance of the woollen or more commonly worsted, warps; and the combination with them of wefts in various coloured yarns of wool. Then came the introduction, as backing (out of sight), of linen and hempen yarns, of closer texture and greater strength than can be obtained in wool. Varieties of these simple operations form what are known in commerce as “Kidderminster,” “Venetian,” and “Scotch” carpeting; and of these all countries make more or less—our own trade in this cheap class of goods being very large. They are principally made in Yorkshire, Durham, and Scotland; the trade of Kidderminster itself being now confined to a superior class of goods altogether.

I.—The industrial aspect of the subject.

Original simple woven carpet;

as Kidderminster, Scotch, Indian, &c.,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

tufted car-
pets,

excellent,
but costly,

from hand-
work,

how manu-
factured.

Of common goods the Exhibition contains very few samples from any country, the competition amongst the exhibitors raging almost exclusively between those engaged in producing the highest class of carpets, such as involve the execution of elaborate designs in the most durable shape. The next stage of elaboration in manufacture consists in making both the warp and weft in very strong materials, as of flaxen or hempen yarns, and of interweaving with them tufts or short lengths of wools of various colours, known in France as *moquettes*, so as to make up a thick woollen face, tied in by the stronger yarns. Once safely tied in, it is, of course, possible to cut the ends of the doubled up wools without fear of their pulling out from their backing, and these, pressed down and trodden back by the foot, spread and acquire thereby an additional consistence. This it is which makes all the common class of Turkish, Indian, and Algerian carpets so very durable and agreeable to the tread. Simple as this process may appear, it has enjoyed as wide and uninterrupted a sway as almost any other in the history of industrial art.

The original carpets which the Crusaders brought with them on their return from the East, to gladden the eyes of the faithful with samples of the skill of the "infidel," were made in the very same kind of loom as that which may now be seen in the machinery gallery of the Exhibition, with a half-worked "Smyrna" rug still round upon its warp. This rug is the true type of the hand-worked tufted carpet, whether it take the shape of a perfect, true Axminster in England, of the celebrated Royal manufacture of the Savonnerie in France, of the finest India or Persian carpet, or the ordinary Smyrna, or, as it is commonly called, the Turkey carpet of commerce. The operation of manufacture may be briefly described as follows:—A strong warp of string is stretched, generally vertically, from beam to beam of the loom, each alternate string being "harnessed" to the heddles of the loom. Guided by a drawing, the divisions of which correspond with the width of any given number of warp-strings, intersected at right angles by a given number of weft-strings, the weaver proceeds to wind in and out between the warp-strings differently coloured tufts of wool, in such wise as to leave the ends of the tufts sticking out at right angles to the plane of the warp. Having twisted in a row of tufts all across the loom, he works with the treadle the harness of the loom, raising the alternate strings so as to form the passage between the threads which the weaver calls his "shed." Through this he throws his shuttle, carrying with it a strong weft-string. By depressing another

treadle, he raises a different set of warp-strings, so as to form another shed, through which he throws back the shuttle to its original position. He thus weaves a few strokes, and then proceeds, with what is called the "batten, or lay," to beat back the web and warp strings which he has woven together, so as to make them hold in the woollen tufts as tightly as possible. When that has been evenly done for the whole width of the carpet, he re-commences twisting in between the warp-threads another set of woollen tufts, which he in turn secures by interweaving and beating back; and so with infinite care and patience he labours on until the whole width and length of the original warp-strings are covered with this woollen tufting. The surface is then trimmed over with large shears, in order to cut back to one uniform level any rebellious tufts which may raise their heads above their fellows. Such is, was, and probably long will be, the process of manufacturing the most beautiful carpets which have ever been made, or which as far as I can suppose ever will be made. The defects of the process are obviously its tediousness, and consequent great cost; nevertheless, the Exhibition is full of specimens of such work of the most elaborate description; and these made not only in countries such as India, Turkey, Russia, Algeria, and Holland, where labour is cheap, but in France and England, where machinery is all but human and skilled labour all but priceless. In the former of the two last-named countries the carpets of the Savonnerie and of Aubusson, and in the latter that of Mr. Lapworth, exhibit elaborate processes of hand-working in their highest perfection, next always to the one magnificent specimen sent by the Minister to the Maharajah of Cashmere, and exhibited in the Indian department.

One of the Tunisian carpets and one of the Algerian also stand out in superior excellence before the bulk of the Turkey carpets, which, in point of technical execution, are of a well-sustained high order of merit.

The original process of simple weaving having failed to ensure sufficient durability to the fabric, since wool trampled over in the direction of, or transversely to, the twisted staple of the wool is readily trodden out and unravelled—its own elasticity helping—it was found that the same staple trodden back at right angles to its length was one of the most durable substances possible, in proportion to its bulk. To ensure this condition of weaving by a mechanical instead of by a solely hand-worked process, such as that last described, what is known as "Brussels" carpet-weaving was devised—that is to say, the first operation of the previously well-

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY
&c.

Samples in
the Exhibi-
tion from
India, Tur-
key, Russia,
Algeria,
Holland,
Belgium,
Spain, Aus-
tria, Prussia,
France, and
England.

"Brussels"
carpets;

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

—
how manu-
factured,

known velvet-weaving process was applied to the manufacture of carpets. For the sake of simplicity, let us suppose that the carpet is to be produced in one colour, without any figure upon its surface. The worsted warp, as well as a hempen or linen warp, having been harnessed to the "treadles" and "heddles," as for common weaving, and the passage for the shuttle formed, the weaver throws over, transversely, a hempen or linen shoot, making by throws following the alternate action of the treadles a coarse *canvas* starting. He then begins to interweave his worsted warp, and at this stage the special peculiarity of his process begins. The difficulty is to raise up the worsted warp so as to form the little loops of wool noticeable on the face of a Brussels carpet. This is done by forming a "shed" or shuttle-way between the woollen and the linen warps, the former being raised and the latter depressed. At this stage the weaver inserts a small iron rod into the "shed," or shuttle-way, and presses it home towards his breast. He then works his treadles so as to draw down the worsted warp and raise up the linen one, so confining the iron rod and forming a new shuttle-way. Across this he throws his shuttle, and then again raises the woollen warp. Another iron rod is inserted, and similarly woven in until some half-dozen are confined. The weaver then withdraws the one nearest him for re-use beyond those furthest from him, which are left in to keep the work steady until sufficient weaving is done to prevent any risk of the loops pulling out. Care is of course taken, by beating a sort of strong comb (the "batten") back towards the breast of the weaver, to keep the work well closed up and compact as it goes on. In this way a plain Brussels carpet may be made; but the problem is much complicated when patterns with several colours are required. For each separate colour a separate worsted warp is indispensable; and it is obvious that lengths of each thread of the warp must be used, varying with the proportions of each colour brought up, by looping, to the surface of the fabric. Each thread, therefore, requires to be wound, at the end furthest from the weaver's "breast roll," round a separate bobbin, weighted so as to give it a slight tendency to rotate in its frame in a direction contrary to that in which it would be moved by pulling up the thread to form the loop. This gives an equal amount of tension to the woollen warp-threads, whether they be much or little used in the formation of the pattern. Of course all the bobbins, with the yarns of the same colour, are fixed upon the same frame; and the carpet is generally spoken of as a two-frame, three-frame, four or five "frame," or "ply" carpet, according to the number of

such separate frames or sets of coloured warps requisite for the development of the pattern. The mounting of the loom is now generally effected on the "Jacquard" system, the beautiful automatic operation of which raises for every stroke of the shuttle and insertion of the iron rods just those threads from each frame which should be brought to the surface in order to form the pattern with proper loops. Some idea of the complication arrived at at this stage may be formed from a knowledge that to weave a good figured carpet, yard wide, involves the use of about 1,800 bobbins and threads for each web.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

involving
great com-
plications,

The conversion of this from a hand-worked process into a power-loom process is one of the greatest triumphs of modern ingenuity; and it is most honourable to English ingenuity and perseverance that every difficulty has now been overcome in this country, and that Kidderminster, Durham and Glasgow now manufacture Brussels carpets for all the world. Strange to say, however, in spite of the general consumption of the article, I scarcely observed a "Brussels" carpet in the whole Exhibition.

how con-
verted in
England
from a
handworked
to a "power
loom" ma-
nufacture.

To convert a Brussels carpet into a "pile" carpet, all that is requisite is to borrow the second operation from velvet-making. This consists in ploughing a groove into the surface of the iron rods around which the loops are twisted, and taking care that the rods are so inserted as to keep this groove always furthest from the back of the carpet. A sharp cutter run along the line of this groove from side to side at once releases the rod and forms the cut pile. The surface is subsequently trimmed, or shorn, to make the whole perfectly true and level. A carpet so woven becomes what is commonly known as a Jacquard woven cut-pile carpet, and this description of carpet forms the staple of the French and English goods sent to the Exhibition. I shall presently note the leading exceptions. In 1855 everyone interested in such machines was delighted with the loom for manufacturing Brussels and velvet-pile carpeting which was exhibited by Mr. Wood, of Monkhill, and which was as perfectly self-acting as any such machine could be conceived to be.

Process, and
conversion
to "pile"
fabric, with
Jacquard
pattern.

The next stage in the working out of carpet-making machinery was the endeavour to get rid of the complicated sets of frames with infinite bobbins for multiplied colours. This has been attempted in two ways, one unsuccessful, the other successful. The former by attempting to print and "dye" a plain tufted fabric so as to cover it with various coloured patterns. This failed because it turned out to be impossible to more than superficially dye the wools, if the

Simplifica-
tion of pro-
cess,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

by Whit-
tock's in-
vention;
with Cross-
ley's im-
provements.

fabric was of sufficient closeness of texture to be good and durable in wear. The successful process—the brilliant invention of Mr. Richard Whittock of Edinburgh—in which, under the auspices of Sir Francis Crossley, an immense trade is carried on at Halifax, consists in translating upon paper the finished pattern as it should appear, when the carpet is laid down, into another pattern representing what would be the pattern if all the threads of which the finished carpet would be composed should be pulled out and laid flat side by side. A series of threads are then coloured to correspond with this pattern (suppressing the lengths usually thrown to the back of a carpet made on the old plan) by an ingenious operation too complicated for description in this report. The threads so dyed are then arranged as warps, and in that form present a most singular appearance, not indicating in the slightest degree to the uninitiated eye the pattern intended to be ultimately realised. The subsequent operation of weaving up the printed warps restores the translation to the original. Either Brussels or velvet pile carpets may of course be made by this process, and such carpets are generally known as “printed warp” carpets. The chief alleged drawback to these carpets is that the printing of the woollen threads is not supposed to give them quite as good or solid a colouring as when they are dyed in the yarn. The chief alleged drawback to the Jacquard pile carpets is that they are apt to run short in the staple. Mr. Alexander Whittock of Edinburgh, in an excellent paper on carpet manufacture and design read at the Society of Arts in 1856, points out the extreme economy effected by his relative's improvement. “Not only,” says he, “is the Jacquard superseded, and the large frames done away with, but it is possible to place three looms to be occupied on this new fabric into the space which one Brussels loom requires. One beam is substituted for 1,300 little beams or bobbins, and a better cover is made with 780 threads than with 2,600.”

Tests of
excellence in
carpet ma-
nufacture.

The four great tests of excellence in both Brussels and pile carpeting are—first, the length of the loop, or pile; second, the quality of the woollen yarns; third, the number of threads to the inch in width; and, fourth, the compactness of weaving at the back, so as to perfectly tie in the loops and cut filaments which form the pile. If the pile, or tufts, can be made perfectly secure from pulling out in wear, the longer they are, or rather the higher they rise from the back of the carpet, the greater will its durability be. It is much easier to tie in “moquettes,” or little tufts of wool plaited in by hand securely (because the threads of the tuft are already intertwisted and matted together before tying), than any

loop or tuft formed from wool or worsted which has been spun, or has once been brought into a state of even moderate tension: since the latter operation injures the natural tendency of the fibre to interlock. That is why the hand-worked Turkish and Indian goods can be made so extraordinarily lasting. Among the Algerian rugs in the present Exhibition was one I examined with the British juror,—Mr. Peter Graham,—which, for fulness and length of pile, combined with admirable strength in the tying in, was, although of rough appearance, from imperfect shearing, an admirable model of what such a carpet should be in texture and mode of manufacture.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

In mentioning Mr. Graham's name, I feel it right to acknowledge how much I learnt from a close examination of the products of Class 18, with one so thoroughly competent to judge them in every respect as that gentleman.

The next great stage of improvement in carpet making aimed at the suppression of the complicated "frames," or "plys," for each separate colour, and yet the employment of wools "dyed in the yarn."

Brilliant
improvement

This has been achieved by the adoption of one of the most brilliant ideas which ever entered the head of a manufacturer.

Hitherto, we have seen all attempts at carpet weaving with a pile made either by inserting tufts of wool or by bringing the warp-threads into loops to the surface for subsequent cutting. The process I am about to describe goes upon the entirely different system of attaching the tufts or cut-pile to a strong weft-thread, and then so interweaving this tufted weft-thread with linen or hempen warp-threads, as to make a compact fabric, with all the woollen pile on the surface. If it is difficult to do this in a plain monochrome fabric, how much more difficult must it be to so carry it out as to produce a figure of various colours upon the surface? The present Exhibition contains many attestations of the successful resolution of the problem by Mr. James Templeton, of Glasgow.

effected by
Templeton
of Glasgow.

To this gentleman I applied for some special information as to his most ingenious invention, and received a kind and most modest reply, in which, after doing full justice to contemporary makers of carpets by other processes, he goes on to state:—"You are aware that the Axminster carpet, first made in the town of Axminster, was an imitation, and was made or woven in the same manner as the Syrian or Turkey carpet—that is, by tufting or knotting on to a vertically placed warp the yarns which form the surface and pattern. This was, and still is, a very tedious process. For ten years previous to 1839 (in which year I patented the invention of making or weaving Axminster carpeting by

His process
of manufac-
ture based
on "che-
nille" weav-
ing.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

a new process) I was a shawl manufacturer in Paisley, and, amongst other goods, made a great many of what are termed chenille shawls, the process of which was to weave a pattern on a warp, the warp having been spaced in the reed according to the depth or thickness of pile required. This first cloth was then cut between the spaces into shreds, and then, these shreds having been twisted into a spiral form, they were woven on to another warp, marks for the weaver's guidance having been woven in the first weaving to enable him to place the shreds so as to bring out the complete pattern in the second weaving. The idea occurred to us (one of my weavers and myself) that, if cloth could be so woven as, when cut into shreds and not twisted to form chenille, but left free, so that the two cut edges of the shred might collapse and form a pile, or fur, as we term it, it would, when rewoven on to another warp or surface, produce a velvet, a pile, or an Axminster surface. This was accomplished by a certain mode of gauze-weaving, and a patent was taken out for it. In protecting this patent, in 1847, on a trial in which we got a verdict on all the issues, the Judge (the late Lord Robertson), when re-examining a witness, smartly remarked, after he had seen the difference between our products and those of our opponents (our opponents wished to make out that ours was only the old chenille process), 'Oh! I see—this new fabric (or shred) has its backbone where it ought to be, and the chenille has its backbone in its middle.' I mention this circumstance to help you to recognize the difference between the two; but, if you take any narrow strip of cloth and twist it, you will at once see what was meant. The chenille or twisted strip or shred becoming spiral, gave a pattern on both sides of the cloth, the cut edges standing out, when twisted, in every direction; while our backbone, with its vertebrae, formed a ready-made pile for throwing on one side of the cloth only.

Difficulties
attendant
upon its
introduc-
tion, but
ultimate
great suc-
cess.

"The foregoing will give you an idea of the origin and basis of the structure of our patent Axminster carpeting. Great were the difficulties met with in prosecuting it to a successful issue, involving too great a variety of gradual improvements to describe in detail in the compass of a letter (or of such a report as the present). Every change or new improvement in manufacture has its difficulties: this one certainly had its share, and I do not believe that any consideration or remuneration would induce me to fight the first three or four years' battles over again. By perseverance, however, in the course of years, prejudice was disarmed and difficulties gradually disappeared or were overcome. By aiming at superior fabric and pattern, employing first-class

designers and workmen, and also by providing the best machinery for the various processes, step by step our manufacture has attained the position it now occupies.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

“ I need hardly remind you that there was a time when first-class artists could hardly be induced to prepare patterns or designs for textile fabrics.

Increased
attention
paid to de-
sign.

“ In 1851 we induced Mr. E. T. Paris to give us a design for a medallion carpet and another for a rich table-cover, both of which we then exhibited; and some years ago you yourself were kind enough to prepare for us a series of most suggestive sheets of sketches. More recently still, your professional occupations engrossing you so very much, Mr. Owen Jones has favoured us with carpet designs, several of which are now ‘on cloth’ at the Paris Exhibition. I am glad to know that now other manufacturers of textile fabrics, carpeting and other figured goods, employ superior talent, and sometimes even genius, for these designs (and, from the superior art-education of foreign manufacturers and their workmen or designers, unless this is done to a still greater extent we may be left in the background with regard to many of our textile fabrics) in which, undoubtedly, taste and experienced judgment are as essential to perfect commercial success as the material, even, of which any textile fabric may be made.”

Mr. Temple-
ton's views
thereon.

Mr. Templeton's goods, of which there are many first-rate specimens in the Exhibition, some of which have been manufactured for other exhibitors, have now taken a firm hold in public estimation, and his trade is most extensive.

and current
products.

Other British makers are now bestirring themselves in the same direction, and, as Mr. Templeton's patent rights become public property, there is no doubt that the Kidderminster manufacturers will “take kindly” to the chenille process; and, indeed, already Messrs. Brinton and Lewis, with their “Indian Axminster,” tread closely on Mr. Templeton's heels.

Excellence
of Brinton
and Lewis's
“Indian Ax-
minsters.”

What the future of the carpet manufacture in France and other countries will be it is as yet very hard to prognosticate. In simplification of process with elaborate results they are at present far behind Templeton, Crossley, and Brinton.

France far
behind
Templeton,
Crossley,
& Brinton
& Lewis.

Before leaving the subject of the technical processes of various countries, I should note that, although carpets are now made at Aubusson with velvet pile, the original and special process is a hand-worked one, analogous to that by which Gobelins and Beauvais tapestries are produced. The main difference consists in the texture of the woollen yarns.

I now turn to that which will probably prove the more interesting portion of my subject—its artistic aspect. It is

II.—The
artistic as-
pect of the
subject.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

no doubt good to make a warm, comfortable, durable carpet, but it is something little less essential to enjoyment to make it beautiful also. To do the latter, happily, entails the loss of no single excellence aimed at by those who would attain to the former, and, as far as one's experience in the past extends, it is pleasant to remember that the most beautiful carpets have been also amongst the best and most lasting. Too often in industrial art the beautiful perishes while the ugly endures, but this has been by no means the case with carpets.

Condition of
design ap-
plied to
carpets in
1855.

Mr. Red-
grave's
views there-
on, and
condem-
nation
of French
eccentrici-
ties.

Before instituting any comparison between two bodies in movement, it is well to note the starting-point of each, or rather their relative position at a given point of time. Let us assume as a good point of departure for the comparison of the changes which a period of 12 years has wrought in the artistic aspect of the French and English carpet manufactures, the condition of both at the last Parisian Exhibition in 1855. Mr. Richard Redgrave, than whom no one is entitled to speak with more weight, from his long and close observation of cause and effect in the progress of international manufactures, in the last-mentioned year made a careful record of what he then observed, and found much reason to condemn the irrational style of the majority of the most highly premiated of the French designs.* He thus described a leading Parisian carpet in 1855:—"A mossy border, powdered with daisies, margins a square space, wherein are clustered, as in a parterre, flowers of the largest size and gaudiest hues. From among these flowers grow up funereal yews, and through the openings of their interweaving branches are seen vistas of sunny landscapes, lakes, mountains, and clear blue sky. Above, the stag-like branches of the trees twine into fantastic compartments, in which, or through which, are seen pictured in the upper air manufactories, with their tall chimneys, steam-engines, implements of agriculture and of art, and groups of the products of industry. Then garlands of flowers dangle upwards far into the canopy of sky, on which, as it were, in the very vault of heaven itself, are heaped together grapes, bagpipes, vats, melons, pipes and tabors, sheaves, fiddles, pitchforks, and coats of arms. This, strange as is the description, is a carpet worked for the city of Bordeaux at a great expense, and this, too, designed by one who has received many medals, the manufacturer being honoured by the jury with a first-class medal also. (Mr. Redgrave had previously described

* Mr. Redgrave on "Design as applied to Manufactures." Reports to Government on the Paris Universal Exhibition.

some other equally wonderful specimens of extravagance in carpet design.) These are taken almost at random; notes of many other important works are but repetitions of the same characteristics. What wonder, then, that within the circle of the panorama nineteen-twenties (this is said advisedly) of the carpets there displayed—carpets for the household, not for the palace—were equally treated as pictures, very many of them consisting of flowers combined with landscapes; and, of course, as being made in breadths, repeating such pictures many times over the same floor.”

Such was no extraordinary illustration of the current faults of French carpet design as they appeared to a cultivated observer in 1855, one, however, keenly alive to the manufacturing skill and graphic power which the execution of such difficult productions may be said to have wasted. The English goods exhibited on the same occasion, if less ambitious, were more reasonable; if involving less draughtsmanship in the preparation of the designs, they were certainly carried out in quieter and better taste. This wise restraint may have been partly due to our scarcely possessing at that date the manual dexterity of the French *dessinateurs pour étoffes*, but in a yet higher degree may be attributed to the enunciation of sound principles of industrial design which was made in this country at periods immediately anterior and subsequent to the Exhibition of 1851, which gave an extraordinary impulse to popular as well as professional taste. These wholesome doctrines, thanks to Owen Jones, Mr. Redgrave himself, and to others, took good root, and, after sundry struggles, fructified. To them and to the practical common-sense of many of our best manufacturers we are indebted for the great improvement manifested by the English carpets of 1855 over those shown in 1851, and by the English carpets of 1867 over those of 1855. Writing in the last-named year, Mr. Redgrave says:—“In England the battle of principles has been fairly fought, and is nearly won, for, while our inventions for printing carpets, either in the piece or in the warp, have placed unlimited decorative means at the command of the manufacturers, there is evidence of a more restrained use of these means than formerly was seen even in woven carpets, these having at the same time been greatly and visibly improved in taste and in true principles of decoration.”

Thus it would appear, on the testimony of one well able to judge, that, although the balance of dexterity preponderated in 1855 in favour of the French, that of correct taste was clearly inclining towards the English. In the present Exhibition, with still greater certainty, the same may be

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

Contemporary design in England purer though less facile.

True canons of taste now satisfactorily vindicated by English Exhibitors, —exceptions noted.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

averred, but with the important distinction that the progress of the English in the direction of good command over both colour and form in the ready adaptation of ornament to any given set of conditions has been much more rapid than that of the French towards sobriety and prudence in the class of patterns they use, or rather abuse, for the enrichment of their most elaborate carpets. If we except one or two extraordinary errors in point of taste made by isolated English exhibitors, the productions of the whole of the residue may be accepted as free from any serious reproach, while in France designers and manufacturers of the greatest eminence, even those who direct Imperial establishments, continue to perpetrate clever excesses in all directions—excesses of so flagrant a nature as to be irredeemable by any amount of pictorial skill. It is, in fact, from the superabundance of pictorial facility that most of what is reprehensible in design arises.

Temptations to make carpets pictorial in design.

Dangers of so doing.

There is no class of products of industry more difficult to do justice to in international exhibitions than carpets. Sufficient space can never be afforded for their display as they will be used, and they have consequently to be hung up and shown as pictures. Now, as it may be looked upon as a fundamental principle that no picture could make an agreeable carpet; so likewise, it may be conceded that no good carpet can make a satisfactory picture. The consequence of this vicious system of exhibition is that the greatest possible temptation is offered to the manufacturer competing with his fellows to depart from what is fitting for a carpet in order to make his carpet look a little better when exhibited as a picture. I would not go so far as to attribute to this all the family of bad pictures presented by the florid carpets of the Exhibition; but it certainly tends to their retention long after they have received their *exequatur* at the hands of the “faithful in art.” The chief reasons why what is admissible in a picture, or, with certain differences, in mural decoration or paper-hanging, is inadmissible in a carpet (or, indeed, in any form of ornamental flooring), may be briefly summed up thus:—

Why—
I.—From
varying
sources of
illumina-
tion.

First. The varying sources of light usual in an apartment falsify any attempt at chiaroscuro in the carpet, while, without more or less light and shade, pictorial representation is impossible.

II.—From
falsifications
of perspec-
tive.

Second. The effect of lineal or aerial perspective, or even of undulation, runs counter to the sense of security which should be assured by the surface upon which the foot is planted.

Third. There are but few natural objects suitable for representation pictorially upon which it would be agreeable to tread; and it is impossible to divest the mind of a certain sense of impropriety in trampling even upon the representation of what it would be painful to tread upon in reality.

Fourth. The better the picture the more annoying any soiling of the surface upon which it is portrayed becomes; and an uncomfortable nervous apprehension takes the place of the free and unrestrained use of what should be a comfort rather than a fret.

Fifth. Carpets require to be traversed in all directions; the point of view can never, therefore, be fixed. It is, of course, a fundamental necessity in pictorial representation that the position of the spectator of what is represented should be predetermined, and the only proper point of view for the picture should correspond with such pre-supposed position. As the point of view of a carpet can scarcely ever be fixed, it consequently becomes an improper plane upon which to project pictorial form.

Sixth. To properly see and enjoy a picture the spectator should have free liberty to retire from its surface until his eye is able to comprehend the whole at a glance, and then to approach, in order to be able to examine the careful reproduction of detail. In the case of a picture delineated on the surface of a carpet such a liberty can very rarely exist, since the eye of the spectator can scarcely ever be withdrawn from it more than about six feet without looking at it at such angles as to produce rapid foreshortening and a consequent falsification of relative dimensions in the objects portrayed.

Such being a few among the many good reasons which exist why a carpet or any other ornamental floor or floor covering should never be a picture, it is strange that throughout the Western world, from the classical ages to the present, in the form either of mosaic, tarsia, majolica, stone or marble inlay, or embroidered or woven carpeting, there has been an almost incessant effort to produce horizontal pictures in materials ill calculated for their satisfactory execution.

In the East, however, better traditions and better taste have been preserved. India and Persia, Turkey and Morocco have steadily maintained the beautiful geometrical grouping of conventional forms which are most fitting for use in the textile arts, and most especially for such fabrics as cannot be exhibited vertically when in ordinary use.

Well, indeed, may Mr. Owen Jones direct us, as he has done in his admirable letter in the *Times* of April 19 last, to the fountains of inspiration of which he has himself drunk

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

III.—From pictures affording awkward treading.

IV.—From fear of soiling and spoiling.

V.—From constant change of observers' point of view.

VI.—From inability of observers to duly recede and approach.

These dangers little heeded, and consequent frequent failure in ambitious carpet design.

Good principles always maintained in the East.

As testified by Mr. Owen Jones,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

as a writer,

and as a
successful
designer.

Carpets
as back-
grounds.

so deeply. Well may he point out to us that, while in the practice of the West there are danger and confusion, in the traditions of the East lie safety and simplicity.

In speaking of the Orientals, Mr. Jones says:—"By an unerring instinct and tradition they are able to apply ornament to the surfaces of objects they desire to decorate in the exact proportion and scale which the general form, material, and destination of such objects require. In the balance of colours, and in the distribution of the lines of the ornament, they arrive at a perfection which it seems beyond the European mind to reach. . . . We would venture to recommend the visitor who desires to study this Exhibition with reference to the influence of art on manufactures to commence his studies with the Oriental collections. When thoroughly impressed with the true principles of decoration and ornament which he will find in these works, and carrying these principles in his mind during his visits to the collections of European countries, we feel assured that he will value these latter only so far as they observe the general laws of all art, and which Orientals so instinctively follow—laws which were equally followed in all great periods of art, and which are to be found in all great works of the past. It is the neglect of these unvarying principles which leads so often to ugliness and bad taste in the incessant search of the present time after novelty irrespective of fitness." The man of "the present time," so arraigned at the bar of criticism, naturally rebels, and proclaims his independence of tradition, which he regards but as a thralldom, limiting invention and inducing monotony. On this ground he will find Mr. Owen Jones quite ready to meet him with a vindication of the infinite novelty and invention which may be found in every variety of Oriental fabric. All are subordinated to common principles of structure and to common limits as to the reproduction of natural types, and yet each sample is a fresh and distinct delight. Can the same be said of the corresponding fabrics of the West?

These, it may be remembered, are not the sentiments of a theorist only, but of one who has shown in this very Exhibition, and in the class on which I am writing, his power to practice as well as to "preach." Next in point of excellence to the carpets of the East, upon which Mr. Owen Jones has founded his style, may, I think, certainly be ranked those exhibited by Messrs. Templeton, and manufactured from Mr. Jones's design. His arrangements of form and colour for the rugs of Messrs. Willis, of Kidderminster, are no less happy. Both are unfortunately displayed, the former especially so, since the mass of window immediately over

the range of carpets takes almost all the brilliancy out of the livelier colours, and turns the neutrals all but black. These carpets are especially calculated to serve as "fonds," and to bring out to the utmost the characteristics of the mural decorations and sumptuous equipment in furniture, works of art, &c., of the apartments in which they may be laid down.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
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Allowance in looking at them, and, indeed, at any other carpets in the Exhibition, must be made for the awkward angle at which the top light strikes the wool, and is hidden, as it were, from the eye of the spectator. As he looks up to a carpet suspended vertically above his head he sees the side of each filament of wool, of which the carpet is composed, in shadow only, the illuminated side of the same filament being visible only to an eye placed above the level of the filament. The consequence is that the whole effect of the carpet is unnaturally darkened, and the luminosity is taken out of its scale of colour. As carpets are illuminated and seen in use the effect is entirely different. When so tested the light is usually found to fall almost at right angles to the surface of the carpet, and to so illuminate the whole length of its filaments or pile; while the eye of the spectator, looking down upon the surface of the carpet almost at the same angle, sees the light glancing all along the length of the filament or pile. The consequence is that the lowest toned tints acquire strength and vivacity, and give relief and brilliancy to the lighter and more vivid colours.

Impossi-
bility of
properly ex-
hibiting
carpets
when sus-
pended ver-
tically.

How and
why.

The general use of ornamental flooring in the East, and parquetry on the continent of Europe, tends to the maintenance of the popularity of rectangular carpets over those manufactured in widths, such as our usual Brussels goods, and adapted for completely covering surfaces of any irregularity of form. It is, of course, much less difficult to produce an agreeable design when that design is bounded by a regular figure than when it is limited to a short "repeat," running into all the corners and recesses of a room; and, further, it is much easier to produce an agreeable symmetrical design when the whole is contained, as in the case of a rug, within a few square feet than when it is extended to very many, as in the case of a large carpet. The reason of this is, that the eye of the spectator, always remaining at about an equal distance from the surface of the carpet spread upon the floor, embraces at one view easily the whole area of the rug, while of the carpet it with difficulty takes in without moving any more than a fractional part of the whole design. Hence it is, that generally we are better pleased

Carpets of
regular fi-
gure easier
to design
than "all
over" pat-
terns.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

How and
why.

Vigour of
colour es-
sential.

with the patterns of rugs than of carpets, although an equal amount of clever design may have been applied to each. It is with a view to evade the difficulty of embracing the whole of a large design at one view that the Orientals with such excellent tact subdue by equal balancing and minute subdivision the component parts of all their large designs; thus entertaining the eye with symmetry upon a small scale, and preventing its desire to run out over the extended pattern in search of the completion of the form upon a fraction of which it has first seized. Neglectful of such prudent restraint in large modern carpets, we often find a line or border of white, or of brilliant colour, running over the whole carpet and giving, as it were, the key to its geometrical setting out. The purpose and working of this line are, of course, apparent and rational enough when the whole carpet is seen; but when the eye is fixed, perhaps, upon not more than one-sixteenth of the whole, the purpose of the line is not revealed, and all the filling in, which is grouped about this line, appears to be equally purposeless. The true principle is that rather of subdividing the whole area of the carpet into symmetrical forms, as in an ordinary mosaic pavement, and then of so grouping those symmetrical forms, each complete in itself, as to make them work together to the composition of some general effect, bounded and kept together by a strong border. When this principle is followed the eye is satisfied if it takes in only one-sixteenth, say, of the whole; it is again satisfied if it takes in a quarter of the whole, when it becomes sensible of a new basis of composition; and it is ultimately gratified with an aspect of fresh completeness when it embraces the whole area of the carpet. When it is neglected, unless the whole of the carpet, or at any rate more than half, can be seen at a glance, the pattern seems purposeless; and, from aiming at expressing too much design, the artist conveys to the spectator's eye the impression of his having given little or none. It is better even that his complete carpet should be monotonous than that its subdivisions should be unsymmetrical.

It is the very strength of illumination to which carpets are generally exposed, and the proximity of their surface to the eye, which demand and enforce solidity and sobriety of tone. Weak tints will never answer; the designer must work rapidly, with a full brush, a strong will, no vacillation, and a rich palette, and with the full assurance that none of his work can ever escape attention. All will be well and clearly seen, and a uniform strength and manliness of tone must therefore be sustained over the whole. Depth of tone should be obtained by the agglomeration of vigorous colours in

small compartments, and by the avoidance of strong contrasts in immediate proximity, either of light and dark, or of complementary colours; and not by lowering tones, as by the general addition of black. In fact, to borrow the painter's phraseology, power and depth should be got by "first-painting" and not by "glazing-down." Great richness is frequently obtained in the finest Persian carpets by subtle differences in the most highly illuminated tints, as by working with alternate crimson and scarlet reds, instead of with one monotonous red between the two, as we often do, or by using, say, a turquoise and an ultra-marine blue together, or by relieving a "lemon" against a "cadmium" yellow. Transparent half tints of great power are obtained by admixtures, as by spotting a black ground with orange to produce a luminous effect of brown instead of using a solid untransparent brown; or by spotting a black ground with blue and yellow to obtain a vivid olive, instead of using a solid olive, which in the mass would only look dead and heavy. Such fabrics are full of subtle contrivances which seem to spring into being spontaneously under the hand of the true artist. The painted picture-books of the Japanese are singularly rich in these subtleties.

In assessing progress generally there are two tests which should be applied—viz., endeavours to ascertain the relative abundance of the very good and the relative scarcity of the very bad. Applying these tests to assess the amount of progress made in the carpet trade since 1851, the first, the abundance of the very good, is slightly in favour of 1867. In point of excellence of manufacture this is scarcely so conspicuous, as in point of propriety of design. India and Turkey are, as usual, unimpeachable. France in all its productions of Oriental styles is very good; and in England most of the carpets of Templeton, Jackson and Graham, Brinton, Southwell, Boyle and Smith, and Lapworth are better than the best of the goods manufactured by English carpet manufacturers in 1851 (if we except, perhaps, one carpet designed by Pugin), or even in 1855 or 1862. The rugs of Willis, of Kidderminster, constitute a notable advance; and so, in a particular direction, do the goods exhibited by Messrs. Jones and Willis and others in the Architectural Court.

In Belgium, Russia, and Holland the advance is not marked; but in Austria, through the powerful house of Haas and Sons, a great deal has been achieved.

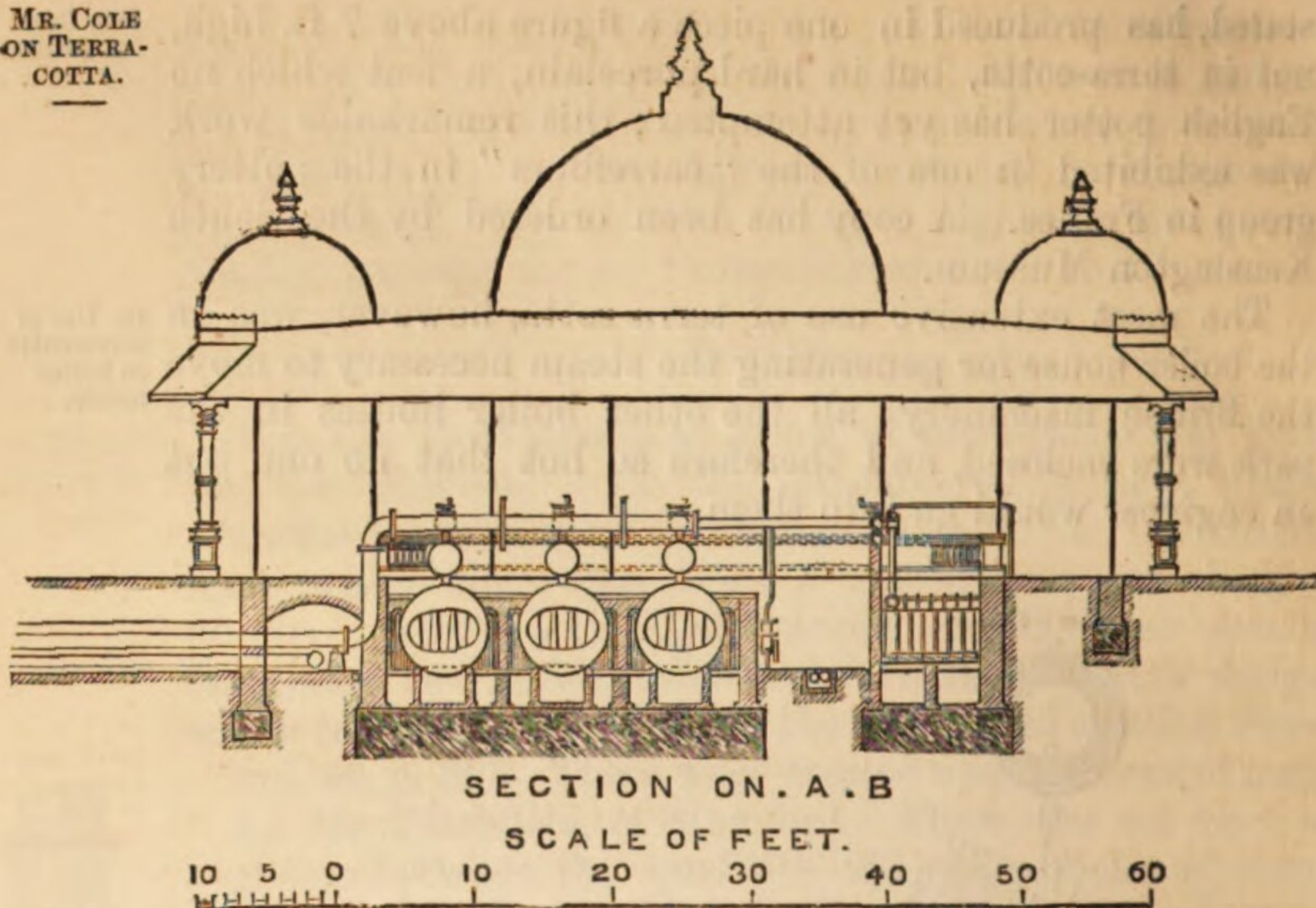
When we apply the second test, that of the relative scarcity of the very bad, we shall find a still more notable advance. If some extraordinary picture carpets, such as

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

How to be
obtained.

Tests of
progress
applied to
India, Tur-
key, France,
England,
Belgium,
Russia, Hol-
land, Aus-
tria, in the
shape of
predomi-
nance of the
really good.

The same
in the
shape of
"relative
scarcity" of
the very bad.

MR. COLE
ON TERRA-
COTTA.

was a chimney shaft. The colonnaded temples in India furnished exactly the type of structure wanted for both house and shaft, and the British boiler house was designed after Syud Oosman's tomb of the fifteenth century, at Ahmedabad; but Italian terra-cotta and not Hindoo details were used for the sake of economy, in order that they might be employed hereafter in England. In the chimney shaft were used good moulded brick by the Bishop's Waltham Company, who showed the excellence of their clay in some pottery in the building. This boiler house excited much interest, especially among foreigners.

Before leaving the subject of terra-cottas the visitor would have taken himself to Mr. Beresford Hope's division, illustrating "arts cognate to architecture;" it was next to the British picture gallery, and good specimens of Blashfield's terra-cottas, designed by Mr. C. Barry, as well as other specimens by Pulham, were to be found there.

The revival of terra-cotta for architecture is comparatively in its infancy. The prices of the makers are capricious; sometimes English tenders will show a difference of 300 per cent. or more. In France slabs of terra-cotta, glazed, about 2 ft. long by 18 in. wide, cost 5f.; in England they cost 18s. But in France a large majolica column would cost four times as much as the same column made by Messrs. Minton.

The price in London of ordinary terra-cotta facing for buildings with a bond of $4\frac{1}{2}$ in. and 9 in., that is to say,

14. Specimens in Mr. Beresford Hope's division.

15. Revival of its use in architecture.

16. Price.

with an average bond of $6\frac{3}{4}$ in., may be assumed to be from 3s. 4d. to 3s. 6d. per foot superficial. The price will vary somewhat, according to the intricacies of the ornament and also with the size of the blocks required. When coal and clay are both to be had at the site of the manufactory the work can of course be executed more cheaply than when they have to be brought from a distance, and it appears probable that a reduction of 40 per cent. may be eventually made.

MR. COLE
ON TERRA-
COTTA.

The expense of fixing the terra-cotta on a three-storied building may be assumed to be from 1s. to 1s. 2d. per foot superficial, including materials and hoisting, but not scaffolding, which as it would generally be required for the bricklayers' work need not therefore be specially erected.

17. Expense
of fixing.

The great buildings now contemplated or in course of actual construction in different parts of Europe will equalize prices and afford valuable international lessons. At Munich several large buildings in brick and terra-cotta are completed. So in London there are the two large hotels of the South-eastern Railway, the Sun Fire Office at Charing Cross, and the South Kensington Museum, and the Royal Horticultural Gardens, where terra-cotta has been used for decoration. At Berlin a great chemical college is nearly completed. The new cathedral at Berlin it is said will be of brick and terra-cotta; and so will be the new covered coliseum, the Royal Albert Hall of Arts and Sciences, now erecting at Kensington-gore.

18. Use of
brick and
terra-cotta
in large
buildings.

These are among the evidences which show that Egyptian, Grecian, and Roman history, in terra-cotta at least, is now being repeated among the nations of Europe.

19. Conclu-
sion.

REPORT ON CARPETS, TAPESTRY, and other STUFFS for FURNITURE.—(Class 18.)—By M. DIGBY WYATT, Esq., Architect, and Juror for Class 15.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

THERE are two distinct aspects under which all carpets present themselves generically—the one industrial, and the other artistic. The industrial aspect comprises the theory of manufacture, and the relations of the fabric to comfort, durability, and economy. The artistic aspect takes cognizance of the greater or less beauty of the design which adorns the carpet. That design may generally be regarded as falling into one of two categories—viz., firstly, into what the French call a “fond,” or unobtrusive basis, calculated to serve as a background, from which furniture may be satisfactorily detached; or, secondly, a picture complete in itself, and upon which the eye may rest with complacency, provided that the “ensemble” or whole effect of the design can be embraced from a single point of view. Such being the general outline of the analysis of the subject, as it presents itself to my mind, I propose to adopt its various headings as the skeleton upon which it may be well to hang the various remarks upon detail which will constitute the bulk of the present report.

General aspects of the subject—the industrial and the artistic; the former in relation to use, the latter to delight. Carpet design supplies either a background or a picture.

The above constitute the chief headings of this Report.

Beginning, then, with the industrial aspect of the subject, it will be found that in all countries the original and commonest description of carpet differs but little from the ordinary coarse woollen cloth of the nation. In the East, the cradle of carpet manufacture, the “suttringee,” or common cotton rug, or small carpet, is an “institution” throughout India, as not very long ago the “Kidderminster” was with us. The first fundamental improvement upon the simple weaving together of a cotton or woollen warp and weft consisted in the doubling in substance of the woollen or more commonly worsted, warps; and the combination with them of wefts in various coloured yarns of wool. Then came the introduction, as backing (out of sight), of linen and hempen yarns, of closer texture and greater strength than can be obtained in wool. Varieties of these simple operations form what are known in commerce as “Kidderminster,” “Venetian,” and “Scotch” carpeting; and of these all countries make more or less—our own trade in this cheap class of goods being very large. They are principally made in Yorkshire, Durham, and Scotland; the trade of Kidderminster itself being now confined to a superior class of goods altogether.

I.—The industrial aspect of the subject.

Original simple woven carpet;

as Kidderminster, Scotch, Indian, &c.,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.
—

tufted car-
pets,

excellent,
but costly,

from hand-
work,

how manu-
factured.

Of common goods the Exhibition contains very few samples from any country, the competition amongst the exhibitors raging almost exclusively between those engaged in producing the highest class of carpets, such as involve the execution of elaborate designs in the most durable shape. The next stage of elaboration in manufacture consists in making both the warp and weft in very strong materials, as of flaxen or hempen yarns, and of interweaving with them tufts or short lengths of wools of various colours, known in France as *moquettes*, so as to make up a thick woollen face, tied in by the stronger yarns. Once safely tied in, it is, of course, possible to cut the ends of the doubled up wools without fear of their pulling out from their backing, and these, pressed down and trodden back by the foot, spread and acquire thereby an additional consistence. This it is which makes all the common class of Turkish, Indian, and Algerian carpets so very durable and agreeable to the tread. Simple as this process may appear, it has enjoyed as wide and uninterrupted a sway as almost any other in the history of industrial art.

The original carpets which the Crusaders brought with them on their return from the East, to gladden the eyes of the faithful with samples of the skill of the "infidel," were made in the very same kind of loom as that which may now be seen in the machinery gallery of the Exhibition, with a half-worked "Smyrna" rug still round upon its warp. This rug is the true type of the hand-worked tufted carpet, whether it take the shape of a perfect, true Axminster in England, of the celebrated Royal manufacture of the Savonnerie in France, of the finest India or Persian carpet, or the ordinary Smyrna, or, as it is commonly called, the Turkey carpet of commerce. The operation of manufacture may be briefly described as follows:—A strong warp of string is stretched, generally vertically, from beam to beam of the loom, each alternate string being "harnessed" to the heddles of the loom. Guided by a drawing, the divisions of which correspond with the width of any given number of warp-strings, intersected at right angles by a given number of weft-strings, the weaver proceeds to wind in and out between the warp-strings differently coloured tufts of wool, in such wise as to leave the ends of the tufts sticking out at right angles to the plane of the warp. Having twisted in a row of tufts all across the loom, he works with the treadle the harness of the loom, raising the alternate strings so as to form the passage between the threads which the weaver calls his "shed." Through this he throws his shuttle, carrying with it a strong weft-string. By depressing another

treadle, he raises a different set of warp-strings, so as to form another shed, through which he throws back the shuttle to its original position. He thus weaves a few strokes, and then proceeds, with what is called the "batten, or lay," to beat back the web and warp strings which he has woven together, so as to make them hold in the woollen tufts as tightly as possible. When that has been evenly done for the whole width of the carpet, he re-commences twisting in between the warp-threads another set of woollen tufts, which he in turn secures by interweaving and beating back; and so with infinite care and patience he labours on until the whole width and length of the original warp-strings are covered with this woollen tufting. The surface is then trimmed over with large shears, in order to cut back to one uniform level any rebellious tufts which may raise their heads above their fellows. Such is, was, and probably long will be, the process of manufacturing the most beautiful carpets which have ever been made, or which as far as I can suppose ever will be made. The defects of the process are obviously its tediousness, and consequent great cost; nevertheless, the Exhibition is full of specimens of such work of the most elaborate description; and these made not only in countries such as India, Turkey, Russia, Algeria, and Holland, where labour is cheap, but in France and England, where machinery is all but human and skilled labour all but priceless. In the former of the two last-named countries the carpets of the Savonnerie and of Aubusson, and in the latter that of Mr. Lapworth, exhibit elaborate processes of hand-working in their highest perfection, next always to the one magnificent specimen sent by the Minister to the Maharajah of Cashmere, and exhibited in the Indian department.

One of the Tunisian carpets and one of the Algerian also stand out in superior excellence before the bulk of the Turkey carpets, which, in point of technical execution, are of a well-sustained high order of merit.

The original process of simple weaving having failed to ensure sufficient durability to the fabric, since wool trampled over in the direction of, or transversely to, the twisted staple of the wool is readily trodden out and unravelled—its own elasticity helping—it was found that the same staple trodden back at right angles to its length was one of the most durable substances possible, in proportion to its bulk. To ensure this condition of weaving by a mechanical instead of by a solely hand-worked process, such as that last described, what is known as "Brussels" carpet-weaving was devised—that is to say, the first operation of the previously well-

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY
&c.

Samples in
the Exhibi-
tion from
India, Tur-
key, Russia,
Algeria,
Holland,
Belgium,
Spain, Aus-
tria, Prussia,
France, and
England.

"Brussels"
carpets;

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

—
how manu-
factured,

known velvet-weaving process was applied to the manufacture of carpets. For the sake of simplicity, let us suppose that the carpet is to be produced in one colour, without any figure upon its surface. The worsted warp, as well as a hempen or linen warp, having been harnessed to the "treadles" and "heddles," as for common weaving, and the passage for the shuttle formed, the weaver throws over, transversely, a hempen or linen shoot, making by throws following the alternate action of the treadles a coarse *canvas* starting. He then begins to interweave his worsted warp, and at this stage the special peculiarity of his process begins. The difficulty is to raise up the worsted warp so as to form the little loops of wool noticeable on the face of a Brussels carpet. This is done by forming a "shed" or shuttle-way between the woollen and the linen warps, the former being raised and the latter depressed. At this stage the weaver inserts a small iron rod into the "shed," or shuttle-way, and presses it home towards his breast. He then works his treadles so as to draw down the worsted warp and raise up the linen one, so confining the iron rod and forming a new shuttle-way. Across this he throws his shuttle, and then again raises the woollen warp. Another iron rod is inserted, and similarly woven in until some half-dozen are confined. The weaver then withdraws the one nearest him for re-use beyond those furthest from him, which are left in to keep the work steady until sufficient weaving is done to prevent any risk of the loops pulling out. Care is of course taken, by beating a sort of strong comb (the "batten") back towards the breast of the weaver, to keep the work well closed up and compact as it goes on. In this way a plain Brussels carpet may be made; but the problem is much complicated when patterns with several colours are required. For each separate colour a separate worsted warp is indispensable; and it is obvious that lengths of each thread of the warp must be used, varying with the proportions of each colour brought up, by looping, to the surface of the fabric. Each thread, therefore, requires to be wound, at the end furthest from the weaver's "breast roll," round a separate bobbin, weighted so as to give it a slight tendency to rotate in its frame in a direction contrary to that in which it would be moved by pulling up the thread to form the loop. This gives an equal amount of tension to the woollen warp-threads, whether they be much or little used in the formation of the pattern. Of course all the bobbins, with the yarns of the same colour, are fixed upon the same frame; and the carpet is generally spoken of as a two-frame, three-frame, four or five "frame," or "ply" carpet, according to the number of

such separate frames or sets of coloured warps requisite for the development of the pattern. The mounting of the loom is now generally effected on the "Jacquard" system, the beautiful automatic operation of which raises for every stroke of the shuttle and insertion of the iron rods just those threads from each frame which should be brought to the surface in order to form the pattern with proper loops. Some idea of the complication arrived at at this stage may be formed from a knowledge that to weave a good figured carpet, yard wide, involves the use of about 1,800 bobbins and threads for each web.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

involving
great com-
plications,

The conversion of this from a hand-worked process into a power-loom process is one of the greatest triumphs of modern ingenuity; and it is most honourable to English ingenuity and perseverance that every difficulty has now been overcome in this country, and that Kidderminster, Durham and Glasgow now manufacture Brussels carpets for all the world. Strange to say, however, in spite of the general consumption of the article, I scarcely observed a "Brussels" carpet in the whole Exhibition.

how con-
verted in
England
from a
handworked
to a "power
loom" ma-
nufacture.

To convert a Brussels carpet into a "pile" carpet, all that is requisite is to borrow the second operation from velvet-making. This consists in ploughing a groove into the surface of the iron rods around which the loops are twisted, and taking care that the rods are so inserted as to keep this groove always furthest from the back of the carpet. A sharp cutter run along the line of this groove from side to side at once releases the rod and forms the cut pile. The surface is subsequently trimmed, or shorn, to make the whole perfectly true and level. A carpet so woven becomes what is commonly known as a Jacquard woven cut-pile carpet, and this description of carpet forms the staple of the French and English goods sent to the Exhibition. I shall presently note the leading exceptions. In 1855 everyone interested in such machines was delighted with the loom for manufacturing Brussels and velvet-pile carpeting which was exhibited by Mr. Wood, of Monkhill, and which was as perfectly self-acting as any such machine could be conceived to be.

Process, and
conversion
to "pile"
fabric, with
Jacquard
pattern.

The next stage in the working out of carpet-making machinery was the endeavour to get rid of the complicated sets of frames with infinite bobbins for multiplied colours. This has been attempted in two ways, one unsuccessful, the other successful. The former by attempting to print and "dye" a plain tufted fabric so as to cover it with various coloured patterns. This failed because it turned out to be impossible to more than superficially dye the wools, if the

Simplifica-
tion of pro-
cess,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

by Whit-
tock's in-
vention;
with Cross-
ley's im-
provements.

fabric was of sufficient closeness of texture to be good and durable in wear. The successful process—the brilliant invention of Mr. Richard Whittock of Edinburgh—in which, under the auspices of Sir Francis Crossley, an immense trade is carried on at Halifax, consists in translating upon paper the finished pattern as it should appear, when the carpet is laid down, into another pattern representing what would be the pattern if all the threads of which the finished carpet would be composed should be pulled out and laid flat side by side. A series of threads are then coloured to correspond with this pattern (suppressing the lengths usually thrown to the back of a carpet made on the old plan) by an ingenious operation too complicated for description in this report. The threads so dyed are then arranged as warps, and in that form present a most singular appearance, not indicating in the slightest degree to the uninitiated eye the pattern intended to be ultimately realised. The subsequent operation of weaving up the printed warps restores the translation to the original. Either Brussels or velvet pile carpets may of course be made by this process, and such carpets are generally known as “printed warp” carpets. The chief alleged drawback to these carpets is that the printing of the woollen threads is not supposed to give them quite as good or solid a colouring as when they are dyed in the yarn. The chief alleged drawback to the Jacquard pile carpets is that they are apt to run short in the staple. Mr. Alexander Whittock of Edinburgh, in an excellent paper on carpet manufacture and design read at the Society of Arts in 1856, points out the extreme economy effected by his relative's improvement. “Not only,” says he, “is the Jacquard superseded, and the large frames done away with, but it is possible to place three looms to be occupied on this new fabric into the space which one Brussels loom requires. One beam is substituted for 1,300 little beams or bobbins, and a better cover is made with 780 threads than with 2,600.”

Tests of
excellence in
carpet ma-
nufacture.

The four great tests of excellence in both Brussels and pile carpeting are—first, the length of the loop, or pile; second, the quality of the woollen yarns; third, the number of threads to the inch in width; and, fourth, the compactness of weaving at the back, so as to perfectly tie in the loops and cut filaments which form the pile. If the pile, or tufts, can be made perfectly secure from pulling out in wear, the longer they are, or rather the higher they rise from the back of the carpet, the greater will its durability be. It is much easier to tie in “moquettes,” or little tufts of wool plaited in by hand securely (because the threads of the tuft are already intertwined and matted together before tying), than any

loop or tuft formed from wool or worsted which has been spun, or has once been brought into a state of even moderate tension: since the latter operation injures the natural tendency of the fibre to interlock. That is why the hand-worked Turkish and Indian goods can be made so extraordinarily lasting. Among the Algerian rugs in the present Exhibition was one I examined with the British juror,—Mr. Peter Graham,—which, for fulness and length of pile, combined with admirable strength in the tying in, was, although of rough appearance, from imperfect shearing, an admirable model of what such a carpet should be in texture and mode of manufacture.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
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In mentioning Mr. Graham's name, I feel it right to acknowledge how much I learnt from a close examination of the products of Class 18, with one so thoroughly competent to judge them in every respect as that gentleman.

The next great stage of improvement in carpet making aimed at the suppression of the complicated "frames," or "plys," for each separate colour, and yet the employment of wools "dyed in the yarn."

Brilliant
improve-
ment

This has been achieved by the adoption of one of the most brilliant ideas which ever entered the head of a manufacturer.

Hitherto, we have seen all attempts at carpet weaving with a pile made either by inserting tufts of wool or by bringing the warp-threads into loops to the surface for subsequent cutting. The process I am about to describe goes upon the entirely different system of attaching the tufts or cut-pile to a strong weft-thread, and then so interweaving this tufted weft-thread with linen or hempen warp-threads, as to make a compact fabric, with all the woollen pile on the surface. If it is difficult to do this in a plain monochrome fabric, how much more difficult must it be to so carry it out as to produce a figure of various colours upon the surface? The present Exhibition contains many attestations of the successful resolution of the problem by Mr. James Templeton, of Glasgow.

effected by
Templeton
of Glasgow.

To this gentleman I applied for some special information as to his most ingenious invention, and received a kind and most modest reply, in which, after doing full justice to contemporary makers of carpets by other processes, he goes on to state:—"You are aware that the Axminster carpet, first made in the town of Axminster, was an imitation, and was made or woven in the same manner as the Syrian or Turkey carpet—that is, by tufting or knotting on to a vertically placed warp the yarns which form the surface and pattern. This was, and still is, a very tedious process. For ten years previous to 1839 (in which year I patented the invention of making or weaving Axminster carpeting by

His process
of manufac-
ture based
on "che-
nille" weav-
ing.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

a new process) I was a shawl manufacturer in Paisley, and, amongst other goods, made a great many of what are termed chenille shawls, the process of which was to weave a pattern on a warp, the warp having been spaced in the reed according to the depth or thickness of pile required. This first cloth was then cut between the spaces into shreds, and then, these shreds having been twisted into a spiral form, they were woven on to another warp, marks for the weaver's guidance having been woven in the first weaving to enable him to place the shreds so as to bring out the complete pattern in the second weaving. The idea occurred to us (one of my weavers and myself) that, if cloth could be so woven as, when cut into shreds and not twisted to form chenille, but left free, so that the two cut edges of the shred might collapse and form a pile, or fur, as we term it, it would, when rewoven on to another warp or surface, produce a velvet, a pile, or an Axminster surface. This was accomplished by a certain mode of gauze-weaving, and a patent was taken out for it. In protecting this patent, in 1847, on a trial in which we got a verdict on all the issues, the Judge (the late Lord Robertson), when re-examining a witness, smartly remarked, after he had seen the difference between our products and those of our opponents (our opponents wished to make out that ours was only the old chenille process), 'Oh! I see—this new fabric (or shred) has its backbone where it ought to be, and the chenille has its backbone in its middle.' I mention this circumstance to help you to recognize the difference between the two; but, if you take any narrow strip of cloth and twist it, you will at once see what was meant. The chenille or twisted strip or shred becoming spiral, gave a pattern on both sides of the cloth, the cut edges standing out, when twisted, in every direction; while our backbone, with its vertebrae, formed a ready-made pile for throwing on one side of the cloth only.

Difficulties
attendant
upon its
introduc-
tion, but
ultimate
great suc-
cess.

"The foregoing will give you an idea of the origin and basis of the structure of our patent Axminster carpeting. Great were the difficulties met with in prosecuting it to a successful issue, involving too great a variety of gradual improvements to describe in detail in the compass of a letter (or of such a report as the present). Every change or new improvement in manufacture has its difficulties: this one certainly had its share, and I do not believe that any consideration or remuneration would induce me to fight the first three or four years' battles over again. By perseverance, however, in the course of years, prejudice was disarmed and difficulties gradually disappeared or were overcome. By aiming at superior fabric and pattern, employing first-class

designers and workmen, and also by providing the best machinery for the various processes, step by step our manufacture has attained the position it now occupies.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

"I need hardly remind you that there was a time when first-class artists could hardly be induced to prepare patterns or designs for textile fabrics.

Increased
attention
paid to de-
sign.

"In 1851 we induced Mr. E. T. Paris to give us a design for a medallion carpet and another for a rich table-cover, both of which we then exhibited; and some years ago you yourself were kind enough to prepare for us a series of most suggestive sheets of sketches. More recently still, your professional occupations engrossing you so very much, Mr. Owen Jones has favoured us with carpet designs, several of which are now 'on cloth' at the Paris Exhibition. I am glad to know that now other manufacturers of textile fabrics, carpeting and other figured goods, employ superior talent, and sometimes even genius, for these designs (and, from the superior art-education of foreign manufacturers and their workmen or designers, unless this is done to a still greater extent we may be left in the background with regard to many of our textile fabrics) in which, undoubtedly, taste and experienced judgment are as essential to perfect commercial success as the material, even, of which any textile fabric may be made."

Mr. Temple-
ton's views
thereon.

Mr. Templeton's goods, of which there are many first-rate specimens in the Exhibition, some of which have been manufactured for other exhibitors, have now taken a firm hold in public estimation, and his trade is most extensive.

and current
products.

Other British makers are now bestirring themselves in the same direction, and, as Mr. Templeton's patent rights become public property, there is no doubt that the Kidderminster manufacturers will "take kindly" to the chenille process; and, indeed, already Messrs. Brinton and Lewis, with their "Indian Axminster," tread closely on Mr. Templeton's heels.

Excellence
of Brinton
and Lewis's
"Indian Ax-
minsters."

What the future of the carpet manufacture in France and other countries will be it is as yet very hard to prognosticate. In simplification of process with elaborate results they are at present far behind Templeton, Crossley, and Brinton.

France far
behind
Templeton,
Crossley,
& Brinton
& Lewis.

Before leaving the subject of the technical processes of various countries, I should note that, although carpets are now made at Aubusson with velvet pile, the original and special process is a hand-worked one, analogous to that by which Gobelins and Beauvais tapestries are produced. The main difference consists in the texture of the woollen yarns.

I now turn to that which will probably prove the more interesting portion of my subject—its artistic aspect. It is

II.—The
artistic as-
pect of the
subject.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

no doubt good to make a warm, comfortable, durable carpet, but it is something little less essential to enjoyment to make it beautiful also. To do the latter, happily, entails the loss of no single excellence aimed at by those who would attain to the former, and, as far as one's experience in the past extends, it is pleasant to remember that the most beautiful carpets have been also amongst the best and most lasting. Too often in industrial art the beautiful perishes while the ugly endures, but this has been by no means the case with carpets.

Condition of
design ap-
plied to
carpets in
1855.

Mr. Red-
grave's
views there-
on, and
condem-
nation
of French
eccentrici-
ties.

Before instituting any comparison between two bodies in movement, it is well to note the starting-point of each, or rather their relative position at a given point of time. Let us assume as a good point of departure for the comparison of the changes which a period of 12 years has wrought in the artistic aspect of the French and English carpet manufactures, the condition of both at the last Parisian Exhibition in 1855. Mr. Richard Redgrave, than whom no one is entitled to speak with more weight, from his long and close observation of cause and effect in the progress of international manufactures, in the last-mentioned year made a careful record of what he then observed, and found much reason to condemn the irrational style of the majority of the most highly premiated of the French designs.* He thus described a leading Parisian carpet in 1855:—"A mossy border, powdered with daisies, margins a square space, wherein are clustered, as in a parterre, flowers of the largest size and gaudiest hues. From among these flowers grow up funereal yews, and through the openings of their interweaving branches are seen vistas of sunny landscapes, lakes, mountains, and clear blue sky. Above, the stag-like branches of the trees twine into fantastic compartments, in which, or through which, are seen pictured in the upper air manufactures, with their tall chimneys, steam-engines, implements of agriculture and of art, and groups of the products of industry. Then garlands of flowers dangle upwards far into the canopy of sky, on which, as it were, in the very vault of heaven itself, are heaped together grapes, bagpipes, vats, melons, pipes and tabors, sheaves, fiddles, pitchforks, and coats of arms. This, strange as is the description, is a carpet worked for the city of Bordeaux at a great expense, and this, too, designed by one who has received many medals, the manufacturer being honoured by the jury with a first-class medal also. (Mr. Redgrave had previously described

* Mr. Redgrave on "Design as applied to Manufactures." Reports to Government on the Paris Universal Exhibition.

some other equally wonderful specimens of extravagance in carpet design.) These are taken almost at random; notes of many other important works are but repetitions of the same characteristics. What wonder, then, that within the circle of the panorama nineteen-twenties (this is said advisedly) of the carpets there displayed—carpets for the household, not for the palace—were equally treated as pictures, very many of them consisting of flowers combined with landscapes; and, of course, as being made in breadths, repeating such pictures many times over the same floor.”

Such was no extraordinary illustration of the current faults of French carpet design as they appeared to a cultivated observer in 1855, one, however, keenly alive to the manufacturing skill and graphic power which the execution of such difficult productions may be said to have wasted. The English goods exhibited on the same occasion, if less ambitious, were more reasonable; if involving less draughtsmanship in the preparation of the designs, they were certainly carried out in quieter and better taste. This wise restraint may have been partly due to our scarcely possessing at that date the manual dexterity of the French *dessinateurs pour étoffes*, but in a yet higher degree may be attributed to the enunciation of sound principles of industrial design which was made in this country at periods immediately anterior and subsequent to the Exhibition of 1851, which gave an extraordinary impulse to popular as well as professional taste. These wholesome doctrines, thanks to Owen Jones, Mr. Redgrave himself, and to others, took good root, and, after sundry struggles, fructified. To them and to the practical common-sense of many of our best manufacturers we are indebted for the great improvement manifested by the English carpets of 1855 over those shown in 1851, and by the English carpets of 1867 over those of 1855. Writing in the last-named year, Mr. Redgrave says:—“In England the battle of principles has been fairly fought, and is nearly won, for, while our inventions for printing carpets, either in the piece or in the warp, have placed unlimited decorative means at the command of the manufacturers, there is evidence of a more restrained use of these means than formerly was seen even in woven carpets, these having at the same time been greatly and visibly improved in taste and in true principles of decoration.”

Thus it would appear, on the testimony of one well able to judge, that, although the balance of dexterity preponderated in 1855 in favour of the French, that of correct taste was clearly inclining towards the English. In the present Exhibition, with still greater certainty, the same may be

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

Contem-
porary design
in England
purer
though less
facile.

True canons
of taste
now satis-
factorily
vindicated
by English
Exhibitors,
—exceptions
noted.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

averred, but with the important distinction that the progress of the English in the direction of good command over both colour and form in the ready adaptation of ornament to any given set of conditions has been much more rapid than that of the French towards sobriety and prudence in the class of patterns they use, or rather abuse, for the enrichment of their most elaborate carpets. If we except one or two extraordinary errors in point of taste made by isolated English exhibitors, the productions of the whole of the residue may be accepted as free from any serious reproach, while in France designers and manufacturers of the greatest eminence, even those who direct Imperial establishments, continue to perpetrate clever excesses in all directions—excesses of so flagrant a nature as to be irredeemable by any amount of pictorial skill. It is, in fact, from the superabundance of pictorial facility that most of what is reprehensible in design arises.

Temptations to make carpets pictorial in design.

Dangers of so doing.

There is no class of products of industry more difficult to do justice to in international exhibitions than carpets. Sufficient space can never be afforded for their display as they will be used, and they have consequently to be hung up and shown as pictures. Now, as it may be looked upon as a fundamental principle that no picture could make an agreeable carpet; so likewise, it may be conceded that no good carpet can make a satisfactory picture. The consequence of this vicious system of exhibition is that the greatest possible temptation is offered to the manufacturer competing with his fellows to depart from what is fitting for a carpet in order to make his carpet look a little better when exhibited as a picture. I would not go so far as to attribute to this all the family of bad pictures presented by the florid carpets of the Exhibition; but it certainly tends to their retention long after they have received their *exequatur* at the hands of the “faithful in art.” The chief reasons why what is admissible in a picture, or, with certain differences, in mural decoration or paper-hanging, is inadmissible in a carpet (or, indeed, in any form of ornamental flooring), may be briefly summed up thus:—

Why—
I.—From
varying
sources of
illumina-
tion.

II.—From
falsifications
of perspec-
tive.

First. The varying sources of light usual in an apartment falsify any attempt at chiaroscuro in the carpet, while, without more or less light and shade, pictorial representation is impossible.

Second. The effect of lineal or aerial perspective, or even of undulation, runs counter to the sense of security which should be assured by the surface upon which the foot is planted.

Third. There are but few natural objects suitable for representation pictorially upon which it would be agreeable to tread; and it is impossible to divest the mind of a certain sense of impropriety in trampling even upon the representation of what it would be painful to tread upon in reality.

Fourth. The better the picture the more annoying any soiling of the surface upon which it is portrayed becomes; and an uncomfortable nervous apprehension takes the place of the free and unrestrained use of what should be a comfort rather than a fret.

Fifth. Carpets require to be traversed in all directions; the point of view can never, therefore, be fixed. It is, of course, a fundamental necessity in pictorial representation that the position of the spectator of what is represented should be predetermined, and the only proper point of view for the picture should correspond with such pre-supposed position. As the point of view of a carpet can scarcely ever be fixed, it consequently becomes an improper plane upon which to project pictorial form.

Sixth. To properly see and enjoy a picture the spectator should have free liberty to retire from its surface until his eye is able to comprehend the whole at a glance, and then to approach, in order to be able to examine the careful reproduction of detail. In the case of a picture delineated on the surface of a carpet such a liberty can very rarely exist, since the eye of the spectator can scarcely ever be withdrawn from it more than about six feet without looking at it at such angles as to produce rapid foreshortening and a consequent falsification of relative dimensions in the objects portrayed.

Such being a few among the many good reasons which exist why a carpet or any other ornamental floor or floor covering should never be a picture, it is strange that throughout the Western world, from the classical ages to the present, in the form either of mosaic, tarsia, majolica, stone or marble inlay, or embroidered or woven carpeting, there has been an almost incessant effort to produce horizontal pictures in materials ill calculated for their satisfactory execution.

In the East, however, better traditions and better taste have been preserved. India and Persia, Turkey and Morocco have steadily maintained the beautiful geometrical grouping of conventional forms which are most fitting for use in the textile arts, and most especially for such fabrics as cannot be exhibited vertically when in ordinary use.

Well, indeed, may Mr. Owen Jones direct us, as he has done in his admirable letter in the *Times* of April 19 last, to the fountains of inspiration of which he has himself drunk

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

III.—From pictures affording awkward treading.

IV.—From fear of soiling and spoiling.

V.—From constant change of observers' point of view.

VI.—From inability of observers to duly recede and approach.

These dangers little heeded, and consequent frequent failure in ambitious carpet design.

Good principles always maintained in the East.

As testified by Mr. Owen Jones,

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

so deeply. Well may he point out to us that, while in the practice of the West there are danger and confusion, in the traditions of the East lie safety and simplicity.

In speaking of the Orientals, Mr. Jones says:—"By an unerring instinct and tradition they are able to apply ornament to the surfaces of objects they desire to decorate in the exact proportion and scale which the general form, material, and destination of such objects require. In the balance of colours, and in the distribution of the lines of the ornament, they arrive at a perfection which it seems beyond the European mind to reach. . . . We would venture to recommend the visitor who desires to study this Exhibition with reference to the influence of art on manufactures to commence his studies with the Oriental collections. When thoroughly impressed with the true principles of decoration and ornament which he will find in these works, and carrying these principles in his mind during his visits to the collections of European countries, we feel assured that he will value these latter only so far as they observe the general laws of all art, and which Orientals so instinctively follow—laws which were equally followed in all great periods of art, and which are to be found in all great works of the past. It is the neglect of these unvarying principles which leads so often to ugliness and bad taste in the incessant search of the present time after novelty irrespective of fitness." The man of "the present time," so arraigned at the bar of criticism, naturally rebels, and proclaims his independence of tradition, which he regards but as a thralldom, limiting invention and inducing monotony. On this ground he will find Mr. Owen Jones quite ready to meet him with a vindication of the infinite novelty and invention which may be found in every variety of Oriental fabric. All are subordinated to common principles of structure and to common limits as to the reproduction of natural types, and yet each sample is a fresh and distinct delight. Can the same be said of the corresponding fabrics of the West?

as a writer,

and as a
successful
designer.

Carpets
as back-
grounds.

These, it may be remembered, are not the sentiments of a theorist only, but of one who has shown in this very Exhibition, and in the class on which I am writing, his power to practice as well as to "preach." Next in point of excellence to the carpets of the East, upon which Mr. Owen Jones has founded his style, may, I think, certainly be ranked those exhibited by Messrs. Templeton, and manufactured from Mr. Jones's design. His arrangements of form and colour for the rugs of Messrs. Willis, of Kidderminster, are no less happy. Both are unfortunately displayed, the former especially so, since the mass of window immediately over

the range of carpets takes almost all the brilliancy out of the livelier colours, and turns the neutrals all but black. These carpets are especially calculated to serve as "fonds," and to bring out to the utmost the characteristics of the mural decorations and sumptuous equipment in furniture, works of art, &c., of the apartments in which they may be laid down.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Allowance in looking at them, and, indeed, at any other carpets in the Exhibition, must be made for the awkward angle at which the top light strikes the wool, and is hidden, as it were, from the eye of the spectator. As he looks up to a carpet suspended vertically above his head he sees the side of each filament of wool, of which the carpet is composed, in shadow only, the illuminated side of the same filament being visible only to an eye placed above the level of the filament. The consequence is that the whole effect of the carpet is unnaturally darkened, and the luminosity is taken out of its scale of colour. As carpets are illuminated and seen in use the effect is entirely different. When so tested the light is usually found to fall almost at right angles to the surface of the carpet, and to so illuminate the whole length of its filaments or pile; while the eye of the spectator, looking down upon the surface of the carpet almost at the same angle, sees the light glancing all along the length of the filament or pile. The consequence is that the lowest toned tints acquire strength and vivacity, and give relief and brilliancy to the lighter and more vivid colours.

Impossi-
bility of
properly ex-
hibiting
carpets
when sus-
pended ver-
tically.

How and
why.

The general use of ornamental flooring in the East, and parquetry on the continent of Europe, tends to the maintenance of the popularity of rectangular carpets over those manufactured in widths, such as our usual Brussels goods, and adapted for completely covering surfaces of any irregularity of form. It is, of course, much less difficult to produce an agreeable design when that design is bounded by a regular figure than when it is limited to a short "repeat," running into all the corners and recesses of a room; and, further, it is much easier to produce an agreeable symmetrical design when the whole is contained, as in the case of a rug, within a few square feet than when it is extended to very many, as in the case of a large carpet. The reason of this is, that the eye of the spectator, always remaining at about an equal distance from the surface of the carpet spread upon the floor, embraces at one view easily the whole area of the rug, while of the carpet it with difficulty takes in without moving any more than a fractional part of the whole design. Hence it is, that generally we are better pleased

Carpets of
regular fi-
gure easier
to design
than "all
over" pat-
terns.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

How and
why.

Vigour of
colour es-
sential.

with the patterns of rugs than of carpets, although an equal amount of clever design may have been applied to each. It is with a view to evade the difficulty of embracing the whole of a large design at one view that the Orientals with such excellent tact subdue by equal balancing and minute subdivision the component parts of all their large designs; thus entertaining the eye with symmetry upon a small scale, and preventing its desire to run out over the extended pattern in search of the completion of the form upon a fraction of which it has first seized. Neglectful of such prudent restraint in large modern carpets, we often find a line or border of white, or of brilliant colour, running over the whole carpet and giving, as it were, the key to its geometrical setting out. The purpose and working of this line are, of course, apparent and rational enough when the whole carpet is seen; but when the eye is fixed, perhaps, upon not more than one-sixteenth of the whole, the purpose of the line is not revealed, and all the filling in, which is grouped about this line, appears to be equally purposeless. The true principle is that rather of subdividing the whole area of the carpet into symmetrical forms, as in an ordinary mosaic pavement, and then of so grouping those symmetrical forms, each complete in itself, as to make them work together to the composition of some general effect, bounded and kept together by a strong border. When this principle is followed the eye is satisfied if it takes in only one-sixteenth, say, of the whole; it is again satisfied if it takes in a quarter of the whole, when it becomes sensible of a new basis of composition; and it is ultimately gratified with an aspect of fresh completeness when it embraces the whole area of the carpet. When it is neglected, unless the whole of the carpet, or at any rate more than half, can be seen at a glance, the pattern seems purposeless; and, from aiming at expressing too much design, the artist conveys to the spectator's eye the impression of his having given little or none. It is better even that his complete carpet should be monotonous than that its subdivisions should be unsymmetrical.

It is the very strength of illumination to which carpets are generally exposed, and the proximity of their surface to the eye, which demand and enforce solidity and sobriety of tone. Weak tints will never answer; the designer must work rapidly, with a full brush, a strong will, no vacillation, and a rich palette, and with the full assurance that none of his work can ever escape attention. All will be well and clearly seen, and a uniform strength and manliness of tone must therefore be sustained over the whole. Depth of tone should be obtained by the agglomeration of vigorous colours in

small compartments, and by the avoidance of strong contrasts in immediate proximity, either of light and dark, or of complementary colours; and not by lowering tones, as by the general addition of black. In fact, to borrow the painter's phraseology, power and depth should be got by "first-painting" and not by "glazing-down." Great richness is frequently obtained in the finest Persian carpets by subtle differences in the most highly illuminated tints, as by working with alternate crimson and scarlet reds, instead of with one monotonous red between the two, as we often do, or by using, say, a turquoise and an ultra-marine blue together, or by relieving a "lemon" against a "cadmium" yellow. Transparent half tints of great power are obtained by admixtures, as by spotting a black ground with orange to produce a luminous effect of brown instead of using a solid untransparent brown; or by spotting a black ground with blue and yellow to obtain a vivid olive, instead of using a solid olive, which in the mass would only look dead and heavy. Such fabrics are full of subtle contrivances which seem to spring into being spontaneously under the hand of the true artist. The painted picture-books of the Japanese are singularly rich in these subtleties.

In assessing progress generally there are two tests which should be applied—viz., endeavours to ascertain the relative abundance of the very good and the relative scarcity of the very bad. Applying these tests to assess the amount of progress made in the carpet trade since 1851, the first, the abundance of the very good, is slightly in favour of 1867. In point of excellence of manufacture this is scarcely so conspicuous, as in point of propriety of design. India and Turkey are, as usual, unimpeachable. France in all its productions of Oriental styles is very good; and in England most of the carpets of Templeton, Jackson and Graham, Brinton, Southwell, Boyle and Smith, and Lapworth are better than the best of the goods manufactured by English carpet manufacturers in 1851 (if we except, perhaps, one carpet designed by Pugin), or even in 1855 or 1862. The rugs of Willis, of Kidderminster, constitute a notable advance; and so, in a particular direction, do the goods exhibited by Messrs. Jones and Willis and others in the Architectural Court.

In Belgium, Russia, and Holland the advance is not marked; but in Austria, through the powerful house of Haas and Sons, a great deal has been achieved.

When we apply the second test, that of the relative scarcity of the very bad, we shall find a still more notable advance. If some extraordinary picture carpets, such as

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

How to be
obtained.

Tests of
progress
applied to
India, Tur-
key, France,
England,
Belgium,
Russia, Hol-
land, Aus-
tria, in the
shape of
predomi-
nance of the
really good.

The same
in the
shape of
"relative
scarcity" of
the very bad.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

English
progress in
design
mainly due
to A. W.
Pugin and
Owen Jones.

Creed of the
last-named
artist.

that of the portrait of the Emperor, of the twelve apostles, of the meeting of the Emperor and the Queen of England, and one or two more of a similar kind, but less outrageous, are excepted, and the eyes are shut to a few monster roses and too fervid rugs (the latter especially abounding in France), there remains nothing to equal the turbulent allegory and landscape of 1851, and in a minor degree of the succeeding exhibitions. This change for the better is due in a great measure to the just theories enunciated by men like Owen Jones and Welby Pugin, whose honest perseverance and enthusiasm have gone far to strengthen the true-sighted, to determine the wavering in taste, and to convert many a previously "hardened sinner" in the ways of false principles and faulty practice of this branch of industrial art to juster and more reasonable paths. Pugin's views are set forth sufficiently distinctly in his "True Principles" and "Apology," but those of Owen Jones (having been, for the most part, orally enunciated) are not as well known to the literary world as they should be. I may therefore with advantage quote from his privately-printed lectures "On the True and the False in the Decorative Arts" the following articles of his creed as touching the chief products included in Class 18 of the Exhibition of 1867.

"Carpets," says Mr. Jones, "should be darker in tone and more broken in hue than any portion of a room, both because they present the largest mass of colour, and because they serve as a background to the furniture placed upon them.

"As a general rule lighter carpets may be used in rooms thinly furnished than the contrary, as we should otherwise have too overpowering a mass of shade. Turkey carpets are by universal consent adopted for dining-rooms, but not all Turkey carpets (and, indeed, very few) are fitted for such a purpose. The generality of Turkey carpets consist of a border, with the whole middle of the carpet forming one large pattern converging to the centre. All-over patterns are much more rare. In the East Turkey carpets are placed on a raised platform or dais at one end of a saloon, and all round the edge of it are cushions, on which the Easterns recline, so that the whole middle of the carpet is perfectly free, and the complete pattern is seen at a glance. This is not the case when they are transferred to our dining-rooms, where the dining-table alone cuts off the best half of it. So you see even the favourite Turkey carpet must go with the Cashmere shawls, and is another instance of our adopting an article from a foreign country and applying to a purpose for which it was not intended.

“The principle of design in a Turkey carpet is perfect, and our manufacturers would do well, instead of copying them in Axminster, as is their wont, to apply the principles to be learnt from them in producing carpets more in harmony with their requirements.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

“I will say no more on the floral style but to express a regret that the more perfect the manufacturing process in carpets becomes, the more do they (the carpets) appear to lend themselves to evil. The modest Kidderminster carpet rarely goes wrong, because it cannot; it has to deal with but two colours, and consequently much mischief is beyond its reach. The Brussels carpet, which deals with five colours, is more mischievous. The tapestry carpets, where the colours are still more numerous, are vicious in the extreme, whilst the recent invention of printed carpets, with no bounds to its ambition, has become positively criminal.”

The only objections I have ever heard raised to these and similar dogmas of Mr. Owen Jones are that they are so precise and logical as to leave little scope for the change and novelty of style constantly demanded—insufficient latitude for fancy—and that they serve, therefore, as fetters, instead of crutches, to the weak. To this I have heard it replied that for art or art-industry to flourish strenuously in any country, fetters are necessary for the weak. Those who are strong enough may burst away from them if they see fit.

Its use and
its abuse.

It would have been impossible for Mr. Jones to have selected better illustrations of the successful working of his principles than are to be met with in the Indian and Persian departments of the present Exhibition.

In the former are to be found, under Dr. Forbes Watson's judicious arrangement, good samples of five leading varieties manufactured on the continent of India, viz. :—

Indian
carpets—
five varie-
ties:

1. The suttringees, or common cotton rugs and small carpets, generally in stripes or chessboard patterns, blue and white, manufactured on Kidderminster principles, and used all over India.

I.—Common
cotton.

2. A carpet made like Turkey carpeting, but with cotton instead of woollen tufting. These two are common in India, and largely manufactured at Hyderabad, Mysore, Tanjore, Sasseram, Jubbulpore, &c.

II.—Woven
cotton
tufted.

3. Woollen tufted carpets, corresponding with the Turkey carpet of European commerce in material as well as in make. These are largely made now in Northern and Central India and at many Government gaols. Large numbers of convicts are actively employed in this class of production. Several samples of their skill are shown from Jubbulpore Bangalore, Patna, &c. Such carpets, made at Mirzapore, Gorruckpore,

III.—Wool-
len tufted.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

IV.—Cash-
mere wool-
len tufted.

&c., and others of finer quality, are imported into England by well-known dealers, such as Messrs. Watson, Bontor, and Co., Messrs. Robinson, Vincent, and Co., and Messrs. Brinton and Lewis, by the latter especially, as models for their own guidance in manufacture.

4. Carpets made of Cashmere wool, and of the utmost delicacy both of design and fabrication. The most perfect carpet in any department of the whole Exhibition, taking design and manufacture together, is of this class, and has been sent to Europe as a choice specimen of native produce by his Highness Dewan Singh, Chief Minister of Cashmere.

I am glad to know that it has been purchased, at the price of several hundred pounds, for reproduction, if possible, in this country, by Mr. Brinton, with whom, and with Dr. Watson and Mr. Peter Graham, I examined it closely.

V.—Silken
carpets.

The fifth, and most costly of all Indian carpets, is the variety made partially or entirely of silk. The most beautiful carpets of the kind I have ever seen have been old Persian and North Indian. Exquisite examples are now forwarded from Tanjore in Madras and from Central Asia, where at Khutan, in Beloochistan, &c. a most interesting and almost Greek type of design is preserved, differing essentially from either ordinary Hindoo or Mohammedan.

Superb spe-
cimen of
best sorts
from India
and Persia.

Of such silken carpets the Persian department of the Exhibition failed to furnish us with any examples, so far as my observation extended, but by way of consolation for their absence provided, in a series of woollen rugs and divan coverings, an extraordinarily beautiful set of models of what perfect carpets should be. In them the conventional Flora of the carpet designer seemed to bloom into enduring freshness, and unobtrusive liveliness pervaded every specimen. They seemed to have but one fault, viz., high price; not that they appear dear when the infinite amount of hand-work involved in their production is taken into account, but that they were costly as compared with European goods.

In all these carpets the design is unexceptionable; and although there is, as it were, a family "strain" running through the whole, the actual variety of detail seems endless, both in form and colour.

Turkish and
Tunisian
carpets.

The carpets in the Exhibition which manifest the closest kindred to the Indian and Persian are the Turkish and Tunisian. Of the former of these there are no less than some 250 exhibitors, the majority of whom stand upon about an equal footing of excellence. To individualise the "wife of Ibrahim," the "wife of Mustapha," and the inhabitants of this or that village, would be waste of time, except for the Smyrniote agents, who buy up the carpets from the makers

for shipping. We shall rather pursue the subject by noticing the produce of factories in which efforts are made to execute carpets by means of analogous processes, beginning with Holland, and then taking up Russia, Greece, Spain, Austria, Algiers, and Tunis. After a few passing words on Prussia and Belgium, I shall conclude this branch of my subject by noticing the products of France and England in somewhat more detail.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

It is strange that, expressly founded to reproduce such excellent models as are furnished by the majority of the Turkish and Smyrna goods, the Royal Manufactory of Holland, at Deventer, when attempting something exceptional, should fall into a strange error of imitating a third-rate French style. The large carpet with a "marone" ground, and a miserable bunch of roses, or rather red cabbages, on a panel in the middle, sets forth in a very staring shape the prominent defects most usually to be met with in such French carpets as were generally manufactured for exportation to America and elsewhere some twenty years ago, and are still exceptionally produced.

Dutch car-
pets.

In no part of the Exposition is the relative superiority of barbaric over common civilized art, in the arrangement of patterns for carpet fabrics, better or more distinctly shown than in the Russian department. When one turns from the admirable rugs and hangings of "the frosty Caucasus" to the wretched, tufted carpet of Engalytscheff, of Bedischov, rampant with flowers about ten times their real size, and of the crudest possible colouring, it is impossible not to recognize that one is as truly right in principle as the other is truly wrong. The main feature of the wrong in the one case, and the right in the other, consists in the error of the application of imitative art to a fabric, to a use, on a scale, and in a position for which it is totally unfitted, and in the converse. The moment one is impressed with the idea of walking or sitting upon what no person in his senses would think of walking or sitting upon, as I have before said, a painful sense of impropriety is experienced, proportioned in intensity to the vivacity with which this misapprehension of judicious design is expressed in the fabric.

Russian,
especially
Caucasian
carpets.

The Greek mats and carpets are of Kidderminster make, in brilliant and often agreeable colours; very rough and effective, with bold stripes and mosaic patterns.

Greek car-
pets.

There are scarcely any things worse in their way in the Exhibition than the great Spanish carpets, coarsely imitating bad French designs.

Spanish
carpets.

The Austrian carpets by Haas and Sons are, for the most part, excellent both in design and execution. The chief

Austrian
carpets
(notably by

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Haas und
Söhne).

specimen of these manufacturers, the reproduction of an ancient Persian carpet which belonged to Peter the Great, and intended for the Imperial saloon of the new opera at Vienna, is a perfect *tour de force* for closeness of texture and minute rendering of complicated form. Being specially adapted for candlelight effect, it shows to great disadvantage by day; but I can readily believe that, seen by the light for which it was intended, its effect would be admirable. Indeed, it presents a very valuable lesson to the student in this particular, as it will be at once recognized that the addition of the yellow artificial light will darken the greens of the carpet by bringing out the complementary blue, and lighten the red so as to bring it to a just balance with the green; it will also, of course, take the predominating yellow tint of the carpet by daylight out of the whole by intensifying, by "simultaneous contrast," the complementary blues and purples.

Algerian
carpets.

Nothing in the Exhibition, after India and Persia, is better than are the Algerian small carpets and rugs. The colouring is most agreeable, and the make of the carpet, with its long and well tied-in tufts of wool, is calculated to ensure extraordinary durability in wear. This excellence in long-tufted carpeting, rugs, divan coverings, &c. is admirably maintained by the class of carpets shown in the Tunisian department, and made of the long wool of "Deridi." Of the still finer wool of Cashmere there is a "tapis de luxe," lined and fringed with silk, worthy of the most luxurious harem, exhibited by the Prince Mahommed, son of his Excellency Mustapha Khaznadar. I have been informed by one who has long resided in the East that excellent models of Persian and Indian design as applied to carpetings are constantly circulating throughout the southern and western Mohammedan countries, through the sales of their fine "praying carpets" by pilgrims from the far East, whose means becoming exhausted at Mecca, are obliged to part with all their "personalities" in order to find the means requisite to take them home again.

Beautiful
Cashmerian
carpets.

Amongst the carpets of other materials than wool and cotton the most curious of all are two, made of various skins and furs, shown by Greeve and Son, of Amsterdam. The design of one of these is really clever in its way.

Prussian
carpets.

The Prussian carpets are unimportant, although one exhibitor (Schöeller et Fils, of Düren,) shows a readiness to adopt some of the mechanical processes lately perfected in England. The remainder of what is exhibited is principally rather hard and dry imitation of Turkish work, the best being by Gevers and Schmidt, of Schmiedeberg.

From Belgium much better things might have been expected than have been sent. The Royal Manufactory at Brussels of the carpets of Tournay scarcely maintains its old reputation. Considering that Tournay is essentially the father of Kidderminster (the Brussels carpet trade having been introduced into the latter place from the former only about the middle of the last century), one is forced to recognize that the child has wonderfully outgrown the parent. I would, however, except the productions of Braquinié, of Inglemunster.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Belgian
carpets.

We now come to the two countries in which the keenest competition for ascendancy in the general carpet trade is carried on—France and England—and on the relative artistic position of which I have already made some remarks.

In France, the Imperial products of the “Savonnerie,” an establishment incorporated with that of the Gobelins for tapestry, naturally holds the first place. The Savonnerie and the finest of the Aubusson carpets are hand-worked, exactly on the same principle as our old Axminster carpets, but with certain innovations borrowed from the Gobelins practice. The leading specimen of the manufacture is a largish carpet hanging in the middle of one end of the Sèvres and Gobelins court. The design, which is of a singularly harmonious colouring, is founded on old French models, wrought out with the greatest taste by M. Dieterle, perhaps the most distinguished living ornamentist in France. In execution there is nothing else to compare with it; but its very excellence is its greatest drawback. It is too fine a picture to tread on. Interlacing hoops and flowers, and arrows and ribbons (if my memory serves me) are figured in lineal, and coloured in aerial, perspective with perfect verisimilitude. Every curve is struck with the greatest accuracy, the gradation of tone is almost imperceptible, and yet the result is neither good picture, good carpet, nor good ornament. In fact, it can scarcely, I think, be looked upon as other than a costly mistake. I have been, perhaps, especially hard upon this product, but it is only because it is so alluring in its elegance and harmony of tone, as it hangs in a place of honour, that it becomes a “special snare” to the unwary. Carpets are also occasionally made at the Imperial establishment at Beauvais, although the bulk of what is produced at that celebrated establishment more nearly resembles Gobelins tapestry, and is almost exclusively used for furniture covering. In the matter of designs for carpets, M. Clerget, an orientalist, *à la mode de Paris*, exercised some twenty years ago a salutary influence. This, however, seems to have died out, although he is, I believe, still living, and a wilful sort of

French
carpets.
Those of the
Imperial
Manufactory
of the Savon-
nerie,

and of Beau-
vais.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Those of
Sallandrouze
(père et fils).

confusion has established itself between designs fitted for tapestries and those suited for carpets; in other words, between designs suitable for vertical and those fitting for horizontal surfaces.

The well-known house of Sallandrouze (père et fils) fairly sustains its well earned position at the head of the French carpet manufacture as far as dexterity is concerned, although "discretion" may not be regarded as its leading characteristic. It seems, indeed, hardly possible to imagine that the same firm can produce goods varying so absolutely in principle as do the bulk of what it exhibits in the florid old, and still more florid modern, French style, and the specially quiet and agreeable Persian-patterned carpet which is in the centre of the side of the Limoges china court. One of their large carpets, although a little vulgar, narrowly escapes being successful. It is entirely spoilt by an uncomfortable damped blotting-paper coloured centre panel, with some doves and a vase relieved upon it. Upon the whole, one feels most anxious to see this respectable old house, which has worthily sustained the reputation of Aubusson since its factories passed from Royal direction into good commercial and self-supporting hands, take a more independent line, so far as its carpets are concerned. It has too long only done well what it has been accustomed to do well, without marching with or leading a return to more wholesome principles of design for carpets.

Laurent.

In point of quiet good taste, the best goods in the French portion of the Exhibition are those, for the most part in imitation of oriental fabrics, by the house of Bernard Laurent, of Amiens. These are jacquard woven pile carpets of the most vivid and yet very fairly harmonised colouring. In one small and beautiful rug a very happy effect is produced by throwing in a few compartments in silk. The Amiens carpets of the house of Deletoile are also, with certain exceptions, highly commendable. Some of the large carpets, in imitation of Turkish, of the house of Foye Devenne, are excellent; but two of their specimens, one with very large circles and octagons, and the other with very raw-looking flowers, exhibit misapplication of considerable manufacturing skill. If, as is no doubt the case, flowers cannot be executed in any ordinary qualities of carpeting except upon a ridiculously magnified scale, they ought not to be attempted. It is, indeed, somewhat difficult to say when or how they should be.

Deletoile.

Foye De-
venne.

Rozé Abra-
ham.

The large house of Rozé Abraham, of Tours, exhibits very good quiet Persian patterns; and yet, as if to show how hard it is to abandon bad ways and traditions, adds to

them three rugs which, for "loud" pattern and colour, are amongst the worst things of the sort in the Exhibition.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Amongst the private manufacturers of Aubusson who rival MM. Sallandrouze, MM. Eroc (père et fils), who spin their own yarn, exhibit both moquette carpets and plain woven ones in which Persian and the Gobelins traditions fight for predominance over the fortunes of the house. The latter appear to have the best of it; for the place or honour in the Faïence court is given to a sickly but ambitious specimen of the old French style, while many exceedingly harmonious carpets of Persian style hold inferior places on each side of it. They, too, have some fiercely bad rugs.

Eroc.

Masure and Lourthiois, of Tourcoing (Nord), have executed some fairly good patterns, rich and quiet, for the well-known Parisian agency house of Sallandrouze.

Masure and
Lourthiois.

There is a clever kaleidoscopic pattern on a blue ground, by Daumezou, of Nismes; but the rest of the exhibitors in the "Maroquinerie" court show nothing in any way remarkable.

Daumezou.

For a display of many of the worst faults of design, as applied to carpets, the visitor may be referred to the great gridiron upon a crimson ground manufactured by Clement Gravier, of Nismes. J. Vayson, of Abbeville, carries the mistaken application of pictorial art to the carpet trade to nearly its *acme* in his portrait of the Emperor in monochrome. It is not to be denied that in this work very good manufacturing dexterity has been displayed; but what is still wanting, after all, serves only to demonstrate the inexpediency of attempting such *tours de force*. The insufficiency of the pictorial rendering of the subject is naturally heightened into the region of the absurd by the reflection that it would be impossible to use this production as a carpet without literally "trampling under foot" what the present régime, at least, of Frenchmen are "bound to obey and serve" in the highest degree. The large carpet of this manufacturer is one of the most ponderous and remarkable specimens of Jacquard weaving in the building. The mounting of the loom for this must have been most tedious and costly, and it is only to be regretted that so much trouble should have been wasted upon so unsatisfactory a pattern. I have dwelt longer upon the productions of this firm than I might have done if it had held a lower rank in French industry; but when such productions are contributed by a house displaying with its products no less than 18 gold and 12 silver medals, gained in various industrial contests, it indicates an exceptionally low standard of popular taste for a country so far advanced in civilization as France.

Clement
Gravier.

Vayson.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Requillart,
Roussel, and
others.

Upon the whole, in this class the manufacturers of Aubusson make a rare display, in which "what to eat, drink, and avoid," in point of industrial art, is pretty equally balanced; but, while we criticise, it is impossible to help admiring the productions of houses such as those of Duplan and Co., Requillart, Roussel, and Chocquel, Braquenie, and, last, not least, Sallandrouze. Everyone must feel that, with all its faults, it is a great industry, worthily represented.

The English exhibitors suffer much more than the French from their floor-coverings being hung as wall-coverings, since the former wisely do not emulate the pictorial example generally set them by the latter. There is, however, one notable exception; and, as that constitutes the only serious example of heterodoxy left amongst the British, it may be well to dispose of it at once.

The English
carpets by
Taplin,
Beall, and
Co.

Messrs. Taplin, Beall, and Co. have employed, no doubt, an able artist to design for them some very ambitious pictures intended to rival Gobelins tapestries at cheap rates. These pictures have been executed with extraordinary skill by Messrs. Templeton, and they are, to all intents and purposes, carpets. Whether they are intended for covering walls or floors, they are alike open to the very grave objection that the process of chenille weaving is inapplicable to the reproduction of high art. The very basis of the system (which involves, 1st, the reduction of all designs to a system of squaring; 2nd, a translation from that squaring into the gauze woven striped cloth, which when cut up forms the pile weft; and, 3rd, the use of that pile weft with such perfectly even tension as to make each colour find its place exactly with reference to the warp-strings of the fabric) is adverse to the chances of a true rendering of subtle expression or the preservation of dignity. To have attempted to depict the 12 apostles, the Queen, and the Emperor of the French, &c., by such a process, on a grand colossal scale, is a climax of audacity which it would have been better never to have aimed at; such ambitious failures serve only to justify the shrugs which they receive from all who know how such subjects ought to be depicted. If unsatisfactory as hangings, of course such products would be ten times worse as carpets.

Templeton.

When we turn from Mr. Templeton on somebody else's platform to Mr. Templeton on his own, the aspect of matters is, happily, entirely changed. I have already and fully spoken of his merits as an inventor, and of his indomitable energy and perseverance, and have only now to record my satisfaction, as an artist, with all of his products manufactured from Mr. Owen Jones's design. They are in every way

creditable to British industry, and thoroughly justify the gold medal awarded to Mr. Templeton. They are possibly cast in a too uniformly low tone, but it is far better that they should err slightly on this side than upon the other. One of them, with a deep blue ground, is especially admirable. Of this old style—*i.e.*, a free rendering of French designs—Mr. Templeton exhibits one good specimen, manufactured, no doubt, at great cost, and involving much labour and ingenuity to produce, but not altogether to my taste. Such carpets, however, still find a very large sale, and I am told that for export it is of no use manufacturing anything more quiet. For the American market, the manufacturers declare that the more glaring their carpets are the better they are liked.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.
—

Next to Mr. Templeton in order of merit I should certainly place Messrs. Brinton and Lewis, of Kidderminster, also gold medallists, who contribute admirable specimens of a kind of carpet of the chenille genus, but said to be woven with certain novel appliances of which they are commencing the current manufacture at Kidderminster. The texture of these carpets is of the description called patent Axminster, and they certainly exhibit a quality and closeness of substance hitherto not attained, I believe, in any other fabric.

Brinton and
Lewis.

The great advantages these goods are alleged to possess are:—"Delicacy and perfection of pattern, with clearness and softness of detail; solidity in the pile and luxuriousness of tread as a floor-covering; great substance and durability in the wear; the introduction of unlimited colour, affording extensive combination of effect; and, lastly, what is of the highest importance in the demand for first-class fabrics, the capability of being made in the entire piece, without seam, for saloons of any dimension and shape."

The name "Indian Axminster" has been selected for these goods, as the fabric represents the texture and effect of East Indian carpets, with a complete accuracy of detail seldom found in those goods, combined with the luxurious perfection of the Axminster fabric. Messrs. Brinton and Lewis have been greatly assisted in their preparation for the introduction of this valuable class of carpet, the pile of which is at least three quarters of an inch in length, by the judicious advice of Dr. Forbes Watson and Dr. Dresser.

How aided
by Drs. Wat-
son and
Dresser.

The artistic impulse especially given by the latter will no doubt retain the "bloom" and beauty of the patterns in which the Indian Axminsters will be chiefly manufactured.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

The bulk of Messrs. Brinton and Lewis's other exhibited goods consist of various carpets of "Wilton make," woven in widths by patent power-loom, and so sewn up, with borders, &c., as to give all the effect of a carpet specially designed for any apartment.

Dr. Dresser has been good enough to inform me that, out of Messrs. Brinton and Lewis's collection, the white-ground carpet with drab shadow and crimson arabesque scroll, is intended for large saloons, where two-breadth designs are usually preferred, as giving the greater scope for the artist's treatment of a massive subject in relief like this, of flowers and foliage, treated in self colours (*ton sur ton*), with heavy scrollwork to form the setting or panelwork of the whole. The Persian or Turkey carpet next in order is similarly intended for large compartments, but is composed on the principle of flat treatment in design and deep rich tone of colour, with combinations of blue, green, and scarlet, giving different effects in the various figures on the red ground. The medallion centre of this carpet is to occupy the middle of a room, with the other figures grouped around it, the border outside being used to complete the whole, and producing the effect of a carpet in one piece. The crimson Italian scroll carpet is designed for smaller rooms where dark and moderate-sized figures are preferred. The introduction of white ground into the border of this carpet is with the special intention of giving relieving effect to the pervading weight of crimson shades. The browns are to contrast with the deeper tints of crimson used.

The fourth and last made-up carpet is after the best examples of flat treatment applied to the forms of 19th century decorative art. The colours are worked on the principle of illumination to the neutral ground shade, and the conventional forms and the colours used therewith allow of this carpet being equally before the eye from whatever point it is surveyed. The entire effect is bright, and yet the livelier colours are kept in due subordination to the rest. This carpet is for the moderate-sized rooms and libraries of British and continental houses. Of these the second appeared to me to be the most satisfactory in point of design, although there is somewhat too even a balance in it between the red and the blue.

Watson and
Bontor.
Lapworth.

Messrs. Watson and Bontor, and Mr. Lapworth, both well known as dealers of great taste and good judgment, exhibit very fine carpets, the former principally of Indian manufacture, and the latter a real Axminster of the best possible quality. I am informed that Mr. Lapworth is now

the proprietor of the celebrated manufactory at Wilton, which used to be so ably conducted by Mr. Blackmore. Messrs. Henderson, of Durham, show very well with a good rich beaded pattern and quiet diaper and border. Messrs. Jackson and Graham show a noble carpet made for them from a design by Mr. Owen Jones. This is satisfactory in every respect, except that the rectangular framing to some of the panelled forms catches the eye somewhat too readily. Messrs. Woodward, Palmer, and Rudford have made a considerable effort to obtain characteristic designs, but, whether accident has misapplied the labels or the designer has misapprehended the styles, certain it is that what is conspicuously labelled "Pompadour" is more like Gothic than anything else, and "Japanese" is rather Greek. What the "Gothic design, French colouring," may really be meant for I could not make out, as it mainly consisted of a straggling kind of Italian scrollwork on a white ground. It is not that the designs are really bad, but the high-sounding titles are a mistake.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Henderson.
Jackson and
Graham.

Woodward,
Palmer, and
Rudford.

Amongst other manufacturers who exhibit in "admirable form" may be mentioned Messrs. Morton and Humphries, of Kidderminster; Boyle and Smith, of London; and Southwell, of Bridgenorth.

Morton and
Humphries.
Boyle and
Smith, and
Southwell.

As the maker of a specialty—Persian and Smyrna rugs—Mr. Willis, of Kidderminster, occupies a most distinguished place, his exhibition showing much enterprise and the best possible taste. Mr. Harvey's designs for Mr. Willis are admirable.

Mr. Willis's
excellent
rugs.

In generalizing upon the English exhibition, one cannot but be struck by the absence of that class of carpeting in which for merit and extent of manufacture we stand without rivals. I mean the good Brussels carpet of commerce. Our cheap carpets, too, are scarcely at all represented, while in Yorkshire, the north of England generally, and Scotland, we produce enormous quantities of such goods at the lowest price and of the best quality. It is, of course, in the nature of such exhibitions that *tours de force* should be represented, while current manufactures "hide their heads," but, remembering this tendency, critics should not hastily infer that the staple manufactures of the country are degenerating because they may not appear in redundancy at the Paris Exposition.

Absence of
Brussels
carpeting.

We now come to the admirable tapestries and other furniture stuffs, of which the quantity overwhelms as the quality delights us. To begin, of course, with the Imperial establishment of the Gobelines, its importance in the history of industrial art demands that a few paragraphs, founded on recent works on the subject, should be dedicated to a brief

Tapestries.

The Gobe-
lins.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Early tape-
stries in
France.

survey of the history of the manufactory, which is, indeed, little else than an epitome of the whole history of the manufacture.

Setting aside the archæology of the subject, so far as relates to the Middle Ages, the details of which may be readily found in the pages of Potier, Jubinal, and Viollet Le Duc, we may assume, as a *point de depart*, that, until the reign of Francis I., tapestries and carpets were made in France by private enterprise alone. The *haute-lissiers*, the Saracens, and the blanket-makers had carried on their manufactures under the shelter of privileges granted them by the king or provosts, but it was the Flemings, by their manufacturing skill, and the Italians, through their greater dexterity as draughtsmen and designers, who mainly brought the art of making tapestries to perfection.

Under
Francis I.

Francis I. collected the most able weavers he could find, either in France or in Flanders and Italy, the two countries in which this branch of industry had been carried farthest, and established them at Fontainebleau, under the direction of the superintendent of royal buildings, and of Salomon de Herbaines weaver to the king. These artists, for whose use silk, gold, and silver thread were lavishly expended, produced splendid hangings from the designs and cartoons of Primaticcio.

The civil and religious wars of the following reigns were as fatal to royal establishments as to private enterprise, and, amidst the continuous troubles of "the league," the successors of Henry II. were unable to devote much money to any other purpose than the support of their armies.

Under
Henry IV.

About the year 1600 Henry IV. commenced the re-establishment in France of those manufactories for the production of furniture and decorations for the royal palaces which had fallen into decay during the two preceding years, although he encountered in so doing the strenuous opposition of his sagacious minister, Sully, an opposition thoroughly justified by the general exhaustion and poverty of the country. He began by establishing his weavers, Laurent and Dubourg, in a house in the Faubourg St. Antoine, vacated by the expulsion of the Jesuits. On the return of the latter he transferred the students of these master weavers to the galleries of the Louvre, and established there a goodly gathering of masters in art, painters, sculptors, engravers of precious stones, clockmakers, &c.

The chief *haute-lisse* weavers remained but a short time as "compound householders" in the Louvre. Two hundred Flemish workmen were collected and put under their direction, and the manufacture, speedily established in the

Palais des Tourelles, was subsequently transferred to an hotel in the Rue des Varennes. Henry IV., to encourage his protégés, gave them extensive privileges, but his premature death prevented the full development of his projects. His son, Louis XIII., though the founder of the house of the *Savonnerie*, allowed the establishment of his predecessors for tapestry-weaving to fall into decay. The only active steps he took in its favour was continuing to the sons of Mark Comans and Francis Laglanche, master-weavers, the privileges granted to them by Henry IV.

MR. DIGBY
WYATT ON,
CARPETS,
TAPESTRY
&c.

Under Louis
XIII.

Some tapestry made during this reign (and no doubt in the manufactory of which I am speaking) representing the miracles of Saints Crispin and Crispinianus, was, apparently, ordered by the guild of shoemakers of Paris for the chapel of their corporation in Notre Dame. The struggling trade made little head in the troublesome times which succeeded the death of Louis XIII., and it is probable that the nominal patronage of an impoverished Court was rather an impediment than an aid. The weavers suffered, artists languished, and the long wars of the minority of Louis XIV. nearly ruined them. On his ultimate accession to the throne, between the earnest wishes of the King and the able conduct of Colbert, in a few years all the Royal manufactories were reinstated, and their prosperity exceeded that of their best days under preceding Sovereigns.

Under Louis
XIV.

The great Lebrun, first painter to the King, directed the establishment of the *Savonnerie*, at Chaillot, in which Philippe Lourdet had caused children taken from the hospitals to work. Hinart was appointed to take charge of the factory at Beauvais, where furniture-stuffs and hangings were made. The manufactories of Felletin and Aubusson for carpets, &c., owed to the liberality of the King a painter and a dyer, maintained at his expense.

The name "Gobelins," as a designation for tapestry of the highest class, is derived from some former dyers of that name, who carried on their business on the edge of the little River Bièvre, at Paris, on the site of the present Imperial establishment, in 1450, or, as some say, not till the reign of Francis I.

Establish-
ment of
the Gobe-
lins,

It was not, however, until the seventeenth century that the name of the old dyer, Giles Gobelins, was applied to this tapestry. At this date the family of the Gobelins having retired from business, their house passed into other hands, and was rented by the Brothers Cannaye, who, in addition to dyeing, engaged in the manufacture of tapestry. In all probability Jean Liansen made for them, for the first time, tapestry on the *haute-lisse*, or vertical warp.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

under Col-
bert's pro-
tection,

as a Royal
manufactory
for art
industries of
all kinds ;

On the re-establishment of the Royal châteaux, Colbert conceived the idea of decorating them in a manner worthy of the magnificence of their architecture. Choosing the most talented of every profession and trade, he united them in one grand establishment, and gave them apprentices and pupils to study under them.

To extend this establishment he persuaded the King, in 1662 or 1663, to purchase a portion of the building originally occupied by the dyers Gobelins. The augmented establishment was so carried on, from the year 1667, under the style of "The Royal Manufactory of Tapestry and Furniture for the Crown," — Colbert and the chief painter personally assuming, with the King, its direction. By his edicts published at this time it is evident that it was not simply a factory for tapestry that Louis XIV. created. It was a vast studio in which all that can be comprehended under the term "furniture" was made. Two hundred and fifty master weavers wove rich tapestries for which the King's chief painter and his pupils had given designs, and for which the able Jacques Kercoven had dyed the wools or the silks. Sculptors in metal and goldsmiths forged and chased bronze into lamps, sconces, brackets, and candelabra in styles suitable to correspond with the Gobelins and Beauvais hangings. Cabinetmakers carved, turned, and gilded wood furniture after the fashion of the Venetian "magnificenze" then so popular.

and under
Lebrun's
direction ;

Florentines, directed by Ferdinando del Megliorini, collected marbles, agates, lapis-lazuli, &c. for making beautiful mosaics, ornamented with birds, flowers, and fruits, remains of which are still to be met with in the tables in several of the palaces of the time of Louis XIV. Even the very door-locks and window fastenings became chefs-d'œuvres of execution made from the designs of the fertile Lebrun, and, at a later period, of the still more fertile Berain—"dessinateur des menus plaisirs du Roi." The superintendence of Lebrun, which lasted from 1663 to 1690, was an era of prosperity for the Gobelins. He caused pictures designed by him to be accurately copied in wool, such as "The Battles of Alexander," "The History of Louis XIV.," "The Elements," "The Twelve Months of the Year," "The Life of Moses," &c. The greater number of these subjects were embellished with ornaments in gold thread. Many other works were executed, after designs by Van der Meulen, Joart, Bolo, Baptiste, Auguier, and other contemporary artists.

under
Mignard's.

In 1690 Lebrun died, and Mignard succeeded him as chief painter to the King and director of the Gobelins.

The practice of his profession engrossing too much of his time, the King gave him as coadjutors La Chapelle and Bressé, architect and controller of the Royal buildings.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

The first years of the new administration were fruitful. A school of design was established, directed by Tuby, Coysevox, and Sebastian Leclerc, and very important works were commenced; but the reverses which took place towards the end of his reign compelled Louis XIV. to reserve his money for the defence of his country. When peace was ultimately re-established, the production of the Gobelins became more brisk; but from this time the "Royal Manufactory for Crown Furniture" gradually lost its specially comprehensive character, to become only a manufactory of tapestry and carpets. The painters, sculptors, goldsmiths, and workers in mosaic gradually disappeared; it was no longer a school of arts and luxurious manufactures, as when under Lebrun. Through the penury of the Treasury, in 1694, the prosperity of the manufacture declined, and in the following year a number of workmen and pupils were discharged. Under the reign of Louis XV. the factories were closed, and the works totally stopped for a time, to be taken up again and cherished at fitful intervals.

Successes
under Louis
XV. and
XVI.

The chief pieces executed at this date, and indeed until the end of the reign of Louis XVI., were The Four Seasons, after Mignard; the History of Esther, and that of Jason and Medea, after De Troy; many scenes from the New Testament, after Jouvenet; copies of pictures from the Vatican, after Boullouque; the Twelve Months, after Lucas Van Leyden; the History of Moses, after Poussin; a set of curtains in silk, with a gold ground, after Boullouque, Baptiste Monayer, De Fontenay, Audran, and others; eight scenes from the New Testament, after Restout; the History of Mark Antony and Cleopatra, a set of allegorical pictures for the Chancellor's residence, after Coypel, Restout, and others; eight Indian subjects, after Desportes and others; the Field Sports of Louis XV., in four pictures, after Oudry; twenty-one subjects from Don Quixote, by Coypel; a set of mythological and pastoral subjects, by Boucher; the Siege of Calais and the Taking of Paris, after Barthelemy; many subjects from the history of Henry IV., after Vincent and Le Barbier; the Contenance of Bayard, after Du Rameau; the Assassination of Admiral Coligny, after Suvée; the Death of Leonard de Vinci, after Menageot; and the Triumph of Amphitrite, after Faravel. The tapestry of Esther, and that of Jason and Medea, given to the King of England, are said to be still at Windsor Castle.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Improve-
ments.

In 1749 great changes were made in the looms. The cartoons were no longer cut up and placed under the warp but behind the workman, where they could be clearly seen. The picture was traced on a sheet of tracing-paper, which was fastened by hand in the same way that the design had formerly been fixed. These improvements were introduced by Neilson, one of the ablest "heads of departments" who has ever laboured in the old factory on the banks of "the Bièvre." In spite of his improvements, and others devised by the ingenious Vaucanson, the Royal Manufactory suffered about this time greatly from dissensions, which arose between Oudry, the painter, who virtually acted as manager, and other artists, whose works were being reproduced under, as it was alleged, his misdirection. These dissensions were happily put an end to by the appointment of Boucher to fill Oudry's place, upon the death of the latter, in 1753.

But ruined

During this time the department of the Savonnerie, like that of the Gobelins, followed the taste and partook of the style of the period, and the works of Louis XIV. were already greatly modified from their old noble style, when the political struggles of the end of the last century almost threatened the very existence of these beautiful creations. Scarcely had these sad days for art arrived, before hands were laid on the chefs-d'œuvres of the past upon the excuse that they exhibited emblems of the old form of government; and a jury of artists and other "sans culottes" was formed consisting of Prudhon, Duneux, Percier, Bitaubé, Moette, Legouvé; Mouvel, the actor; Vincent, the historical painter; Belle, director of the Gobelins; and Duviviere, director of the Savonnerie.

under the
revolution.

This jury had the audacity to condemn—for singular reasons, principally political—a long list of works, in the creation of which some of them had aided. As to the Savonnerie, that was still worse; there they sacrificed all the finest patterns and productions, except two harmless carpets with flowers. The manufactory which under Louis XIV. numbered 300 workmen and weavers could, in the depth of its tribulation, obtain only 46 signatures to the following sad petition:—

"Citizen Minister.—We venture again to lay our misery before you. The National Treasury does not make the payments you have ordered for our benefit. For 125 days of salary due to us we have only received five days. Without clothes, food, or credit it is impossible to live. We are in despair, and we beg you to give us the means of living elsewhere if you cannot support us here."

Until the reign of Louis XVI. a settled system was followed for executing hangings in sets. Each subject formed a suite of tapestry of different heights and widths adapted to the different rooms which it was intended to decorate in succession.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

For some years of the reign of Louis XVI. tapestry had been made by contract, there being two "haute-lisse" contractors and one "basse-lisse." The King paid on delivery for the tapestry ordered; he lent the factories and looms, and advanced to the contractors the linen web, the wool, and the silk. The revolution of '89 led to great changes in this manufacture; in 1791 workmen were paid by the year, and in this year also were suppressed the various corps d'états which Colbert had established for the sole manufacture of tapestry.

Details of
establish-
ment.

In 1792, at the suggestion of the Minister Roland, the school of design established by Colbert was abolished, and, though the factories were not altogether closed, payments were suspended, as we have seen by the unhappy workmen's petition, during the political agitation which distracted the close of the 18th century.

This disorganization lasted but a short time, since in the year 1802 the manufacture was re-established, and the school of design reopened. A few of the artists returned, but pupils did not re-enter in numbers until the year 1809.

In 1805 Napoleon I. made up his mind to revive the manufacture, and to adopt its products as the chief decoration of his palaces. He began with the Gallery of Diana at the Tuilleries, and speedily caused to be set in hand at the establishment some 20 or more large pictures representing the principal historical scenes in which he had played the leading part. A practical school of dyeing was founded; and chemistry, in the honoured persons of Chaptal and Beathollet, was brought to the assistance of the director of that school, the talented and useful M. Roard, a worthy pendant to Brongniart, at the rival Imperial establishment at Sèvres.

Revival
under Na-
poleon I.

Under the Restoration the Royal manufacture was well sustained, and amongst a series more or less specially devoted to the glorification of the house of Bourbon there show out with peculiar lustre the noble reproductions of the Medicis' Rubens' pictures of the Louvre. Louis Philippe in his turn proved himself a right Royal patron, admirably completing the works commenced by his predecessors; and up to the present time a steady progress has been maintained in every department, reflecting the greatest credit on M. Chevreuil, the head of the dyeing establishment, and on M. Badin, the

Under the
restoration.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

and present
state of ex-
cellence
under the
direction
of M. Badin,
and with
the aid of
M. Dieterle.

present "director," with whom I enjoyed several opportunities of discussing the magnificent figure made by the Gobelins establishment on the present great occasion. He assured me of the lively interest at all times manifested in the productions of the Gobelins by the Emperor Napoleon III., and warmly acknowledged the great assistance he had now for many years received in the artistic department from my respected colleague on the juries of the last three universal exhibitions, M. Dieterle.

In the above notices I have been constrained to omit much of very great interest. My deficiencies may, however, be easily made up for by consulting the excellent "Notice Historique sur les Manufactures Impériales de Tapisseries des Gobelins et de Tapis de la Savonnerie, par A. L. Lacordaire, Directeur," &c.; "Paris, 1853."

I do not purpose entering in this report into the technical processes by which the Gobelins tapestries are produced; partly because they may be so much better understood from even a hasty visit to the manufactory (which is one of the well-known sights of Paris) than they could be from any written description, and partly because they have been so admirably and so frequently described by others, and notably in the above-mentioned work by M. Lacordaire.

Processes of
dyeing the
wools

A few words, however, on that part of the subject which generally escapes the notice of the visitor to the Gobelins—the arrangements made for dyeing all the wools used for the Imperial tapestries, carpets, and furniture stuffs at the present time—may not be out of place or useless. I therefore condense, in great part from the excellent description of the establishment given in the first three numbers of M. Turgand's fine work "Les Grandes Usines" a few particulars of the current practice.

The dyers' workshop in the Gobelins manufactory is, without doubt, the first dyeing establishment in the world; not, of course, from its extent, but on account of the perfection of the processes and the infinite number and systematic preservation of the "nuances" or shades of tints therein produced. M. Chevreuil, member of the Institute, is now, and has long been, its director, with M. Decaux as sub-director. The value of the treatise by the former, "On the Simultaneous Contrast of Colour," is acknowledged by every artist. The workshop is simple, being composed of a drying-room, of a large chamber with coppers for scalding and dyeing, and of a subterranean passage leading to seven furnaces, in which the colouring liquids are boiled. Under the windows flow the sluggish waters of the Bièvre, grey opaque, noisome, creeping slowly between two stone quays

and with its slimy waters charged with all the refuse which flows from the various manufactories upon the little river's banks.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

The following is the process carried on in the dyeing-room:—The wool is mostly Kentish, and is spun at Nonancourt, in the department of the Eure. After having been selected and inspected with the greatest care by the firm of Vulliamy (the agents through whom they are procured), the fleeces are classified, on their arrival at the Gobelins, into very fine fleeces for the Savonnerie and Beauvais work, and those a little less fine, and ultimately differently spun, for converting into Gobelins tapestry. When the yarns have been examined by M. Perrey, chief of the works, they are submitted to a graduated cleansing, according to the colours which they are to receive. Passed through whitewash, subcarbonate of soda, or simply through bran, they are given more or less affinity for this or that tint, according to the duration of the proceeding and the nature of the liquid. The scouring operation requires watching with great care, especially during the bath of subcarbonate of soda, of which the temperature can never exceed a certain fixed limit, without a risk of spoiling the wool. The skeins, passed over long sticks called "lisoirs," are then plunged into square boilers of iron, which hold the mordant, containing more or less alum or tartaric acid, according to the dyes required. After this they are plunged into a bath of colour. The dyeing of the Gobelins has nothing in common with that of establishments which produce some a single colour, as blue or black, others various tints, but limited in range of shade. Such dyeing as this could be executed by inferior workmen; but to produce not only the immense variety of colours, but the twenty or thirty shades of each colour, required for this manufacture, demands the employment of real artist dyers. At the Gobelins the object is to produce only colours of a "good dye"—that is, permanent or "fast" colours—the difficulty is therefore much greater than in the case of most private firms, who only strive after effect. It is chiefly in the clear colours that it is important not to make a blunder. Sad to say, a great number of beautiful pieces made at the beginning of the nineteenth century have been simply ruined by the decomposition of certain dyes, which have turned quite brown, whilst others have faded altogether. Thus the three or four years' work of an artist may be rendered useless by the neglect or mistake of a dyer; but under the skilful direction of M. Chevreuil this danger no longer exists; and the chef-d'œuvres now produced will, it is confidently believed, last as long as organic matter can be expected to exist

described.

Arrangements.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

As to tints
by M. Chev-
reuil.

without losing their value by change of hue. Each tint at the Gobelins, according to its position in M. Chevreuil's well known scale, is graduated in twenty-four tones, from the deepest to the most delicate—from deep red to blush rose tint, from the deepest slate gray to the lightest mother-of-pearl. Those skeins placed side by side in the order of their tints have a most pleasing effect. The gradation between skein and skein is little perceptible to anyone but a workman; but the dyer is not only able to observe it when out of the bath and dry, but even whilst still damp and soaking in the boilers.

How fol-
lowed by
dyers.

The following is the process when only a simple colour is required. The bath is charged with the deepest colour of the scale required; the dyer, having placed upon his sticks the skeins which are intended to be of the deepest tint, plunges them into the bath, watches them, raises them up, hangs them on uprights at his right hand, replunges them in the copper, examines them, and notes the time during which they are soaked or dry. When he considers them to have reached the desired stage they are withdrawn and spread out, replunging them afterwards, if required. During this time the bath gets weaker and weaker; if it loses its colour too quickly more colouring matter is added. The liquid, becoming less charged with colour, gradually reaches so pale a tone that the twenty-fourth tint becomes almost white. It is in these later operations that a sure eye and skilful hand are required; the wool must be completely and thoroughly dyed, and yet at the same time possess the delicacy of shade required. Great care is shown in keeping the skeins, when fully dyed, well sorted, and yet easily accessible, so that there may be no impediment when the weaver has to select his woollen pigments for his day's work.

Beautiful
display.

It is by such an elaborate system alone that works of the perfect pictorial success which must be recognized in the Gobelins tapestry of the present Exhibition can be achieved. Although no one piece in this year's display is as striking as "The Assumption," after Titian, exhibited in 1862, there is a far greater variety of style illustrated, with an even greater amount of harmonious colouring. The striking feature of the present Exhibition is the advantage which it has derived from the active co-operation of Mr. Dieterle, formerly artistic director of the Imperial manufactory at Sèvres. That distinguished artist's sensibility to the value of colour in shadow, and in what the French call "*tons dégradés*," is quite exceptional, and sets off the pictorial *tours de force* of the Imperial manufacture to the utmost.

The largest piece of the Exhibition is a reproduction of the "Aurora" of the Villa Rospigliosi, by Guido. Perfect, no doubt, as a reproduction of the copy made in oil from the original fresco, this picture fails to render either the soft luminosity of a fresco or the intensity of tone of an oil picture, treated as an oil picture should be. In point of fact, it is almost impossible to satisfactorily copy a fresco in oil; and this tapestry being made from such an unsatisfactory translation of the original, fails, of course, in the particulars in which the mistranslation was defective. In the specimen which hangs beneath the Aurora, taken from the beautiful oil picture, by Titian, "Sacred and Profane Love," in the Borghese Gallery at Rome, a much more successful result has been obtained—all the richness and transparency of Titian's luminous palette having been perfectly reproduced. As a masterly illustration of how works of art of the highest character may be allied with the furnishing and hangings of a noble apartment, the student may be invited to carefully study the border by which M. Dieterle has surrounded this beautiful picture. On each side of the "Sacred and Profane Love" hang two *dessus de portes* (or, rather, will hang, for one of them is as yet incomplete), which unite the utmost brilliancy and gaiety of colour with perfect repose and absence of "garishness." The colour of the ground of these little panels is extraordinarily successful, and illustrates admirably a favourite theory of the artist that harmony can never be produced by the opposition of complementaries of equal intensity. In gradations of unequal intensities the eye feels an incessant sense of changeful illumination, which gives a life and grace opposed to the fixed and staring effect which more equal balancing of intensities invariably produces. It would occupy too much space in this report if I were to dwell too long upon the subtleties of polychromy which this year's exhibition of the Gobelins displays. The ordinary spectator will feel them, if he may be unable to trace and unravel them; and the intellectual exercise of picking them out for himself will be invaluable for the decorative artist. I cannot, however, refrain from dwelling upon the set of three hangings of Beauvais manufacture which hang over the left-hand side of the large carpet (by far the least successful of M. Dieterle's works) in the Sèvres Court. The arabesques, which are in a true French rather than Italian style, upon brilliant crimson, deep yellow, and dull sky-blue grounds, are among the most beautiful ever executed; and blend into the perfection of deep, rich, and yet vivid colouring. Too often papers, decorations, and tapestries only make rooms look uncomfortable; but I cannot imagine that a room hung

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Mainly
through
excellent
work, and
M. Dieterle's
fine taste.

Analysis of
merits.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

Beauvais
tapestry.

Furniture
stuffs.
French.

with such tapestries as this, framed in ebony and gold, or in oak with ebony inlays, or in ebony with ivory inlays, or with walnut and mother-of-pearl inlays, could look otherwise than beautiful.

Around the Gobelins Court are arranged many sofas and chairs covered with tapestries made at the Imperial manufactory at Beauvais. They possess all the technical and artistic excellences of Gobelins tapestry, but it is impossible to feel that the designs are often suitable for the purposes to which the pieces of furniture they decorate are usually put.

In France alone we meet with attempts to rival the Imperial manufactures of the Gobelins and Beauvais, and in many cases the rivalry is well sustained. In this line of production for "furniture stuffs" the great house of Arnaud Gadin, of Nismes, stands conspicuous, and well merits the high reward the jury have given to it. At the same time the designs are, to my taste, certainly too pictorial for many of the uses to which the stuffs are applied. For instance, to find oneself sitting upon a pair of doves or darts, or a shepherd and shepherdess, or on a waterfall and ancient château, is not a happy although a by-no-means uncommon sensation in France. Even to be supposed to be crushing a bouquet of lovely flowers does not seem sensible. What is delightful as a picture mounted upon a screen is not so well on the back of a chair, and still less is it well when it forms the seat. These distinctions are not sufficiently felt by the French, who, in spite of their Republicanism and Imperialism, accept anything if it has but the "chic" of the ancient *régime*, and the consequence is that frequently much of their laborious dexterity is misapplied. Another point as to which they are often careless is to prepare for stuffs and hangings, which must be folded irregularly, designs which to have any meaning at all must be fully displayed. I mention these points in connection with such a house as that of Arnaud Gadin not because that house is specially guilty, but simply by way of a hint that the best and most celebrated are not free from reproach on this head. The houses of Walmez, Duboux and Dager, and of Berchoud and Guerreau, of Paris, and that of Bernard Laurent, of Amiens (the last especially in "*étoffes épinglées*"), contribute specimens in which the dyes are beautiful, and the Jacquard weaving unexceptionable. For perfect pictorial work, I was especially struck by the productions of Duplan and Co., of Paris. Requillart Roussel, and Chocquel, also of Paris, sustain by a brilliant display a well-earned reputation, as do Sallandrouze, Père et Fils, of Aubusson and Paris. They exhibit, much as they

have done before, stuffs for furniture beautifully executed, and portières covered with well-executed but misapplied flowers and garlands. Morceaux, of Paris, has some good and some very crude specimens. Mazure and Mazure of Roubaix, is very strong in reps, poplins, and damasks for upholstery.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&c.

In other countries than France, amongst the first of the exhibitors in the department of stuffs for curtains and upholstery generally must certainly be placed the house of Haas und Söhne, of Vienna. For good taste and perfect manufacture of every variety of this class of goods they stand conspicuous; and their display altogether is an honour to their country, and a profit also, since their various establishments give employment to no less than 2,500 workmen. Their portières and curtains are of especial merit, and the skill with which their designers manage to make the most of the silk they combine with wool in mixed fabrics is truly remarkable.

Austrian.

In stamped leather, or leather for covering furniture, there was no novelty. Dulud, in France, has rather fallen off; and an exhibitor named Boucart has advanced. I did not observe any good specimens from other countries.

Stamped
leather.

The Algerian mats are good, though coarse. They are generally very low in tone, but harmonious; the colours rarely more than red and yellow. The Portuguese are satisfactory when in one or two ingrained colours; but when superficially dyed in bright colours the tints become fugitive and the general effect vulgar. The best of all the mats in the Exhibition are the Indian, both in make and appearance. The patterns are quite classical in style, and recall the best types of mosaics for flooring purposes. The grass mats from Palghaut, on the Malabar Coast, made by Koravan Mayau, are of extraordinary strength, durability, fineness, and flexibility. They may be bent almost double without injury, and in the hot weather they are very much used by the natives and Europeans (when once they have found out how comfortable they are) for sleeping upon. Other good Indian grass mats are made at Midnapore, near Calcutta.

Mats—
Algerian,
Portuguese,
and Indian.

In india-rubber and straw matting I noticed no particular novelty; the kamptulicon and linoleum of England were good, both in principle as to decoration and in manufacture. In oil-cloth and floor-cloth England appeared to me to stand *facile princeps*. Nairn of Kirkcaldy, Scotland, with Mr. Owen Jones's help, cuts a capital figure. Crosnier and Roze, in France, were respectable—the former especially in his small-patterned goods.

Floorcloths.

Nairn.

MR. DIGBY
WYATT ON
CARPETS,
TAPESTRY,
&C.

Cotton fur-
niture stuffs.

In furniture stuffs of cotton there was a keen competition in the article of muslin curtains between the French (of Tarare and Saint Quentin) and the Swiss. After much controversy the scale turned, and I think justly, in favour of the former. In chintzes and cretonnes the French excelled, and in the patterns for the latter especially some admirable designs were exhibited, both from Rouen and Muhlhausen. The English in this department did not adequately put forth their strength.

Indian pa-
lampores.

The Indian palampores and block-printed cottons generally were excellent in pattern, as were the embroidered stuffs of all kinds adapted for hangings. The embroideries in silk from Turkey, Greece, Egypt, Algeria, the Caucasus, and China were all full of character, and presented most interesting types, both of form and colour, each harmonising perfectly with the furniture and architecture of the respective countries.

Upon the whole, taking all the sections of this class into account, I felt that the English had the best of it in carpets (both woven and felted), matting generally, kamptulicon, and floor-cloths, and the French in all the other principal departments.

J. S. Tem-
pleton's
hangings.
Heilbron-
ner's em-
broideries.

The English furniture stuffs were far, however, from despicable. The mixed-fabric goods of several manufacturers, the hangings of J. and J. S. Templeton, the mediæval embroideries of Heilbronner, of Regent-street. and probably many other such specialties, possessed admirable features, both of manufacture and style; but, as they were classed for the most part in other sections, their good qualities will no doubt be pointed out by judges more competent to do justice to their merits than I can pretend to be.

REPORT on PAPERHANGINGS.—(Class 19.)—By M. DIGBY
WYATT, Esq., Architect, and Juror for Class 15.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

IN industrial art, as in human life, where the will is freest, and the mode of action most facile, responsibility is greatest: and, as a consequence, discretion is most needed. To be discreet on all occasions is one of the rarest and most valuable qualities which the designer for manufactures can possibly possess. To know when to advance and when to retire, when to attract the spectator's eye and when to escape it, demands both judgment and experience in the highest degree. In few branches of production is the temptation to excess more active than in that of the manufacture of paper hangings. It costs the manufacturer no more, or at any rate little more, to be brilliant than to be sombre. His goods are, perhaps, least costly to produce when they are most glaring and crude.

Value of
discretion
in design.

In one important particular the decorative painter has a great advantage over the manufacturer of paperhangings. The former has a keynote, as it were, struck for his work, by the size, form, situation, mode and sources of lighting, and general aspect of the room he may be called upon to ornament. Sometimes he even knows the furniture belonging to the room. The latter, on the other hand, works, so to speak, in the dark. He can have no idea under what conditions what he makes may be used; he makes to sell, and, with the issue of his goods from his factory, but not with their applicability as decorations, his apparent responsibility, so far as taste is concerned, may be considered to be at an end. In the present day, I believe in the last particular he will find himself mistaken. If he habitually manufactures what may be very well made, but what looks ill under most circumstances, he will lose his reputation, and consequently money, and *vice versâ*.

Comparison
between
paperhang-
ings and
freehanded
painted de-
coration.

Taking into account the large cost of "getting up" an efficient decoration, it becomes, therefore, a real source of economy for the manufacturer to spend his money liberally in getting the best design possible. By employing the highest available talent to advise him before encountering his chief expense, he best ensures that that expense, when made, shall become a source of profit to him; but before even calling in an artist to assist him, it behoves him to make up his mind clearly as to the kind of thing it will be most profitable for him to manufacture.

Difficulties
which sur-
round the
manufac-
turers of
paperhang-
ings.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Value to
them of the
best possible
artistic as-
sistance,

It is one of the most healthy signs for the prosperous future of British paperhanging that the chief exhibitors appear to have sought and obtained the assistance of educated and earnest artists on the present occasion; and it is little less satisfactory to observe that there is an entire absence of the pitiful trade jealousy and secretiveness which lead usually to the suppression of the name or identity of the artist employed. There appears, in fact, to exist now an honourable rivalry amongst the manufacturers as to who shall "get hold" of the right and best man. "Our artist" is no longer confounded with "our traveller" or "our warehouseman;" but he is put forward as responsible for his own share in the productions of the house, to receive praise if they are good, or blame if they are bad.

which must,
however,
be rendered
in a practical
shape to be
of real ser-
vice.

It is of no use, however, employing even the best talent in the production of what will not sell; and of that the manufacturer must be the best judge. The artist may best know what *ought* to sell, the manufacturer knows what *will* sell. Both employ their energies to the best advantage when they combine to produce at once what does sell and what ought to sell; and unless they work together to this end, production is limited either to the pandering to fashion of a passing moment or to the manufacture of unsaleable goods. The great object at the present moment should be to convert change into progress. A shifting public demands novelty, and will have it. Recognize the necessity and give the novelty, not in the form of a transition from one "conceit" to another, but in the form of more beauty, better balance of parts, and purer colouring than any to which the eye of the public has been heretofore accustomed.

How such
assistance
must be
made prac-
tical.

It is of course competent and justifiable for a manufacturer of paperhangings to regard his production as a decoration complete in itself, neither needing nor fearing any addition in the way of picture, mirror, hanging, or furniture to set it off or contrast with it. On that supposition he may dispense with any consideration of whether it would make a satisfactory background for prints or drawings, whether it would "go" with furniture in dark or in light coloured woods, whether it would harmonize with chintz or with silk curtains; and, in fact, he may hold himself free from the necessity for any other study than that of the decoration itself. In freeing himself from the shackles, however, he takes upon himself one burden which requires strong shoulders to support—viz., he must make his decoration beautiful in itself. There is nothing so beautiful as *nudity*, when every form is graceful; but, as we all know, she must be all but a goddess who can dispense with a toilet

in toto. Treating, therefore, a paperhanging under the aspect of a decoration only, the manufacturer must either design it for a set of special conditions—say, for a certain apartment; or he must so design it as to prepare for such modifications in it as may be entailed by the various conditions and features of rooms he never has seen, and which he very probably never may see. Under the first contingency he will probably fail to give satisfaction, because more effect could most likely be got at less cost by free-hand painting; and under the second the difficulties are obviously very great, since a decoration may look very well under one set of conditions which may look very ill under another. The only safe refuge for the manufacturer of paperhangings lies, I think, in analysing the usual component parts of a good decoration, and so designing those parts for the decoration he is about to make as to allow of their being readily brought together in various forms of recombination, without risk of their misfitting or looking incongruous. The bibliophile will at once apprehend the value of the system now recommended when he recalls the great variety of elegant designs which were produced by the collocation and variation of wood blocks in the hands of the early German, Dutch, Italian, and French printers. Many a noble volume is filled from end to end with what appear to be a succession of fresh designs in rich borders and fittings; and yet, on analysis, the whole will turn out to be composed by the permutation of a dozen or so of small wood blocks. Often the same component parts of patterns will recur in the duodecimo which have already done duty in the folio; and by judgment and ingenuity they will be made to look well in both. Should such illustrations not recur to the reader's recollection, he will certainly remember how often he may have admired the dexterity with which the bookbinder, with a few well-arranged simple tools, contrives to vary the decorations of the volume he may have been employed to ornament.

Infinitely various as mural decoration may be made, the eye is generally satisfied with the combination upon any one wall of a set of parts fulfilling the following functions:—1st, that of a cornice; 2nd, that of a frieze; 3rd that of a pilaster, or marked vertical division; 4th, that of a stringcourse, or marked horizontal division; 5th, that of a framework to a panel; 6th, that of a diaper, or panel-filling; 7th, that of a corner-piece changing the rectangular form of a panel; 8th, that of a central ornament to enliven a panel space; 9th, that of a dado forming a quiet base against which furniture will detach itself agreeably; and, 10th, a still quieter plinth, or skirting, reconciling the carpet with the wall enrichment. If

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Great neces-
sity for
"flexibility"
of pattern.

Good models
furnished by
early prin-
ters.

Analysis of
components
of ordinary
paperhang-
ing decora-
tion.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

How such
components
should be
combined
with free-
hand paint-
ing.

such a series of parts, or rather, two or more such series of parts in duplicate or triplicate, are arranged upon some "common measure" of geometrical division and scale, they may be counterchanged in an almost infinite permutation, and great variety of effect obtained at small cost. By employing a greater or smaller series of multiples of the parts in "common measure," the setting out may be altered, and panels formed, subdivided, enlarged, or diminished, almost at will. This is the best way of providing for inevitable alterations and making decoration flexible; but it cannot, of course, lead to exactly the same result, or one as perfectly successful, as might be obtained by specially designing a decoration for a given place and under definite conditions of scale, purpose, lighting, &c. Architects often wonder why a combination should not be made of the two processes of block-printing and free-hand painting to a much greater extent than has been hitherto generally adopted. As yet it has been seldom attempted, except in the cheap furbishing up of minor theatres and concert-rooms, and then upon a wrong principle—viz., that of using the paperhanging to replace free-hand artistic painting for "leading motives," as in groups of flowers, arabesques, &c., leaving the monotonous geometrical or architectural parts to be roughly stencilled or carelessly hand-painted on "pouncing." The result of this treatment is that where the eye chiefly rests the mechanical mode of execution is at once apparent through the formal repetitions of features which any decorative painter would instinctively vary as he went on. The exact contrary to this practice is the one which should be adopted—viz., the *ad libitum* motives should be freely hand-painted on grounded or even block-printed diapered paper, and with body colours from a limited series of "pots;" while all the regular repeats of conventional works, forming borders and frames, stringcourses, cornices, &c. might be block or cylinder printed. The whole would then unite; the mechanism would be unobtrusive; and, at moderate cost, a really original and effective decoration might be produced.

Owen Jones
—his ser-
vices to this
branch of
industry,
by his de-
signs

Mr. Owen Jones, who has assisted the English paperhanging manufacturers more than any other living artist, has brought the experience gained by his almost lifelong labours for Messrs. De la Rue to bear upon the branch of trade now under consideration. Many years ago he designed for that firm an entirely new set of bookbinders' tools, so arranged as to form patterns of endless elaboration by simple juxtaposition in regular geometrical series. A year or two ago he worked out for Messrs. Jackson and Graham a series of blocks for paperhangings, conceived upon the same system. These

were first used, with admirable effect, for a palace decorated and furnished by that firm for his Highness the Pacha of Egypt; and since then they have been multiplied over the face of the country—helping materially to educate the national eye by accustoming it to conventional forms of simple grace and to scales of colour of delicate adjustment.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Mr. Owen Jones is a well known advocate for “the flat treatment” of paperhangings, and has not as yet publicly recognized in his practice the propriety of the admixture of the pictorial with the flat treatment. Before indicating the direction in which I think the views of one who has both taught and practised so successfully in this department of industry may be advantageously extended and relaxed, it will be but fair to reproduce the enunciation of those views given by their originator on the occasion of his well known lectures on “The True and False in Art,” delivered at Marlborough House shortly after the close of the great Exhibition of 1851—a moment when the attention of artists and manufacturers was livelily kindled, and from which a new era may be said to have been instituted for the progress of industrial art, not in this country only, but over the whole face of Europe. The year 1851 will long remain the “stadium” from which industrial mileage will have to be reckoned. Speaking then of the “true and false” in relation to paperhangings, Mr. Owen Jones observes that:—“It is very evident that one of the first principles to be attended to in adorning the walls of an apartment is that nothing should disturb their flatness; yet it is very difficult to find a paper which does not in some way violate this rule. Either we have large masses of conventional foliage, in high apparent relief, surrounding masses of unbroken colour, or representations of flowers, fruits, and ribbons twisted into the most unwarrantable of positions; nothing is more common than to find strawberries and cherries, or other equally impossible combinations, growing on the same stalk; and although great pains are taken to make the fruit and flowers as much like nature as the paperstainer’s art can make them, his imitative skill only increases its inconsistency.

and by his
writings.

His view of
“the true
and the
false” in
paperhang-
ings.

“Strawberries do not grow on walls, but on the ground, and although roses may be trained over walls, they are not endless representations of the same bunches; nor are they interlaced with satin ribbons. I will at once concede that neither the manufacturers who make them, nor the public who purchase them, regard these productions seriously. Viewed in this light, the designs are too absurd to be endurable for an instant; they are only regarded as a means of distributing

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

so much colour over the surface harmoniously and agreeably. This is the very best apology that I can make for them.

“What we contend for is that the same result may be obtained by a more conventional treatment, that we may reach the same end by less vicious means.

“That colour may be so distributed, without incongruous design, we have the Indian fabrics to prove in one direction, and the Gothic papers of Mr. Pugin in another.

“It is not by any means necessary (nay, it would be most unendurable) to adopt the peculiar expression of either of these styles, but the same principles which are common to both would equally lead to the formation of a fresh style of convention, more adapted to our own modes of feeling, if our artists and manufacturers would only lend themselves to the attempt, and if the public would only insist upon requiring it. We say, therefore, that all direct representations of natural objects in paperhangings should be avoided, first, because it places these objects in unseemly positions; secondly, because it is customary in almost every apartment to suspend on the walls pictures, engravings, or other ornamental works; and that, therefore, the paper should serve as a background, and nothing on it should be obtrusive or advancing to the eyes.

Diaper pat-
terns and
flat treat-
ment recom-
mended as
safest.”

“Diaper patterns in self tints are safest for this purpose; but, when varieties of colours are used, the Oriental rule of so interweaving the form and colour as that they may present a neutralised bloom, when viewed at a distance, should never be departed from. The prevailing colours of the walls of rooms hung with printed paper should, of course, vary with the character of the room and aspect. Halls and staircases look well hung with green, because the eye on entering a house is generally fatigued by the strong glare of daylight, and green is the most refreshing colour. Studies and dining rooms look well with dull reds in diapers or flocks, which may be enriched with gold. These form good backgrounds for engravings or pictures; but the reds or greens must never be positive colours, but low-toned and broken, so as not disagreeably to impinge upon the eye. In drawing-rooms, where the paper has more to do towards furnishing and beautifying a room, they may be more gay: almost any tone and shade of colour, heightened with gold, may be used, provided always that the colours are so arranged and the forms so interwoven that a perfect balance be obtained and the eye never attracted to any one portion. Floral-patterned papers have, by universal consent and fashion, been adopted for bed-rooms; and I fear we should gain but little in our attempt to change it; we may contend, at least, that they

should be floral patterns on a very different principle to those now in use; and, for ourselves, we may say that a floral-patterned paper of whatsoever kind is the very last we should think of choosing. Everyone who has been ill of fever, or restless, night or morning, well knows how the vacant mind is constantly exercising its fancy on the pattern of a paper, trying to make all sorts of impossible combinations with it. It is the same impulse which we sometimes feel to jump over a precipice, only in the one case we do not indulge the impulse for fear of consequences, and in the other we do, and thereby materially increase our fever or headache. We, therefore, should choose for ourselves a paper of very low-toned secondaries or tertiaries, and on it we should suspend a very fine engraving from the old masters, or other work of art, as perfect as our means would allow. This would enliven the room, and furnish better contemplation for the mind when feverish or restless than the vain endeavour to make something out of nothing."

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

The decoration Mr. Owen Jones has designed for the present Exhibition, for the enterprising house of Jeffries, has been well rendered by that firm; and exhibits many of Mr. Jones's dogmas carried into successful practice. What are especially noticeable in this decoration are the general blooming cheerfulness of the colouring, which is cast in a bright though tender key; the perfect flow and growth of the stems and leafage; and the well balanced scale and massing of all the conventional forms of which the ornament is built up. As now exhibited—i.e., at an undue height above the level of the eye, and with a top light—the exact reverse of the allowance should be made, which is necessary to a just appreciation of the effect of the gilding in the case of the decoration exhibited by Messrs. H. Woollams and Co., as I shall have occasion to explain further on. In Jeffries's case the gold, which is good and brilliant, is quite flat, and the light, falling upon it from above in a solid mass, is reflected, almost in a sheet, from the surface of the gold to the eye of the spectator; the consequence is that it apparently predominates over the colours to the extent of causing them in certain places to all but disappear. This was never, of course, the effect anticipated by either Mr. Owen Jones or the manufacturer, and under no circumstances in actual use is there the slightest probability that such a dazzling amount of reflection would reach the eye from the brilliant surface of the gilding.

Mr. Jones's
work in the
present Ex-
hibition for
Messrs.
Jeffries.

In the case of Messrs. H. Woollams and Co.'s decoration the gilding is treated on quite a different system, the gold being laid upon a granulated surface. This mode of gilding

Messrs. H.
Woollams'
decoration.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

is peculiarly luminous in cases where the main lighting of the upper part of the room in which a decoration is hung (the gilding of which is carried out on such a surface) is derived from light reflected from the floor of the room. The reason of this luminous aspect is that the light reflected from the floor catches every little projection from the granulated surface, and the lighted part of the granulation is directly exposed to the eye of the spectator looking upwards. The shaded part is, of course, away from and invisible to him. Now, in the case of a top light shining on a similarly granulated and gilt surface, each projecting granulation has a lower side in shade; and when the surface of the gilding, so lit, is above the level of the spectator's eye, it is the shaded, and not the illuminated, side which he sees; or, at any rate, he sees more of the shaded than of the illuminated side, according to the angle of vision. The consequence is that, what on a level with the eye looks a fine luminous mass of gold, when raised above it, shows as little more than a dead colour; and, of course, the original scale of balance between colour and gilding, upon which the designer and manufacturer reckon, is vitiated, and the effect aimed at is not obtained.

Serious
disadvan-
tages of the
mode of
displaying
paperhang-
ings adopted
at the Exhi-
bition.

There is another mode in which the height above the eye at which this particular decoration is placed operates to its serious detriment—viz., owing to the obtuse angle of the visual ray, the spectator looking upwards sees all the forms projected on the vertical plane of the decoration greatly foreshortened; while equal spaces upon any horizontal line scarcely differ to the eye whether they occur at the top or at the bottom of the decoration. It follows that the arabesque upon the pilaster appears unduly huddled together and crowded when contrasted with the ornaments upon the stringcourse and frieze. So detrimental, in fact, are the conditions of display regarded by the manufacturer, that he has assured me that nothing will tempt him to exhibit specially-made decorations again, unless he can feel assured that they will be seen in any exhibition, as nearly as may be, as they would be seen in actual use. Of course, all the paperhangings which are raised considerably above the level of the eye suffer; but those obviously most from which the spectator can recede but little, and in which the predominant forms assimilate to well-known examples, cast in a scale of proportion differing from that into which those more or less formed upon them, are forced by optical distortion. In addition to his decoration, Mr. Henry Woollams showed a few good specimens of “estampé” gilding on flock and raised flocks to the public; and to the jury he submitted portfolios of examples of his current productions, with which they signified their entire satisfaction.

Messrs. H.
Woollams,
other goods.

Among these were conspicuous a class of patterns which find much greater favour at home than abroad. I allude to what are known as "mediæval wall papers." In this department Messrs. H. Woollams and Co. have attained great eminence; and the series they have executed, after designs by Mr. G. T. Robinson, architect, of Leamington, are alike creditable to the manufacturer and the designer. In the first place, these papers are original; in the second, they are based on thoroughly sound principles; and, in the third, they attempt nothing more than they thoroughly well perform. They are no imperfect imitations of things which ought not to be imitated, or, at any rate, not imitated at all, unless they can be perfectly well imitated.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Messrs. Scott and Cuthbertson maintain most creditably the high place they have earned in the trade, especially for their "flock-upon-flock" papers. Their principal decorations consist of raised flock papers, with borders and diapers, both well laid out and balanced. So far the paperhanger; but from that stage begins the work of the decorative painter, who has "grounded," "picked in," and "cut out" his work in the usual style; but in this case with good taste and a general "blooming," and rather delicate effect. Messrs. Scott and Cuthbertson, with a straightforwardness which does them credit, attribute the artistic merit of these decorations, in the case of that reproducing an English style of the 15th century (inclining to the Holbeinesque rather than the Gothic type of the latter part of that century), to Mr. W. Pittman, of London; and, in the case of that in the "Italian style," to Mr. J. Rogers, of Sheffield. As I have already observed, both these are satisfactory, but it appeared to me that they would form better ceiling than wall decorations; and I certainly see no reason why similar raised flock papers should not be largely used to replace elaborate plaster ceilings, or if not to replace them, at any rate to combine with them.

Messrs.
Scott &
Cuthbertson
--their de-
corations;

If Messrs. Scott and Cuthbertson had only exhibited these two decorations, they would have failed to duly vindicate their powers as manufacturers of paperhangings, since for successful effect these decorations have obviously mainly depended upon the decorative painters they have associated with them; fortunately, however, they exhibited a small specimen of uncoloured "flock-upon-flock" printing which received the unqualified admiration of every manufacturer who looked at it. In its way, there was nothing in the Exhibition to approach it. The thickness of the flocking, the flatness of the ground, and the perfectly clean squareness of the raised edges showed the greatest possible dexterity on the part of the printer.

their excel-
lent "flock-
upon-flock"
printing.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Messrs.
Owen & Co.'s
painted
raised flock-
ing cheaply
imitated by
machinery
by Messrs.
H. Wool-
lams.

Hitherto it has been customary for raised flock paper-makers to rely mainly for the decoration of their papers upon the co-operation of the decorative painter. What the decorative painter may do in this direction is, perhaps, best shown by the clever mediæval decoration exhibited by Messrs. Owen and Co., of London, as a background for furniture. If people are content with monochrome, it is best, and probably cheapest, to hang the papers uncoloured, and to paint and "flat" them in the ordinary way when hung; but if it should be desired to "pick out" the grounds or to paint the raised patterns in different colours, a good deal of expensive hand-work is involved. To save this Messrs. H. Woollams and Co., and possibly other manufacturers, whose specimens, from having been shut up in books, I may not have seen, have decorated their raised flocks by machinery in the factory, and now sell a complete decoration of this kind—which requires nothing but hanging—at a moderate rate.

Messrs.
John Wool-
lams.

Messrs. R.
Horne &
Co.

The firm of Messrs. John Woollams and Co., under the able management of Mr. Hubert, retains its old position of excellence as manufacturers both of good block and machine printed papers. Their decoration, designed by Mr. Collman, is correct in its forms and tasteful, but wants vigour and novelty. Their current papers are very good. The exact reverse of this criticism on Messrs. John Woollams' decoration applies to the decoration in the Pompeian style, exhibited by Messrs. Robert Horne and Co. In that there are, perhaps, too much vigour and novelty—there is certainly an absence of taste. The colours are crude and overloaded; they are insufficiently "broken up" with ornamental forms; and it is to be feared that a native of Pompeii, could he rise, literally, from his ashes, would not feel flattered by such a resuscitation in the 19th century of the style of his native city. Still, as a specimen of sound printing in paperhanging, the decoration was good in a manufacturing point of view, and showed that all that was wanting for success was a better pattern; or even the same pattern printed in gentler colouring. This decoration served as a good illustration of the danger of a departure from the safe rule in chromatics—that the eye is pained by large masses of strong, crude colour, and may yet be pleased by exactly the same tints in small compartments or in subdivided forms. The terms "large" and "small" in any such dogmas must, of course, be measured by proportion to the whole area which can be embraced by the eye at one glance from the usual point of view, or within the ordinary limits of distance at which a spectator can plant himself from the surface decorated.

Mr. Land's papers are of no great pretension, and are scarcely so successful in their way as Mr. Marsden's imitations of marbles, some of which attracted a good deal of notice from foreigners.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Mr. Mars-
den.

Upon the whole, the English block-printed goods hold a fair average position; and, if less pictorially successful than the French, show in many particulars a juster appreciation of ornamental design in the flat treatment, specially befitting wall decoration by mechanical means.

Fair position
of English
block-
printed
goods as
contrasted
with French.

In the case of cheap goods produced and multiplied in enormous quantities by machinery, as in those exhibited by C. and J. Potter, of Over Darwen, Lancashire; William Cooke, of Leeds; W. Snape and Co., Heywood Higginbottom, Smith & Co., of Manchester, and others, the very fact of the vastly extensive sale for which they are intended makes the necessity of obtaining first-class patterns one of primary importance, under the double aspect of the education of the eye of the people and of permanent commercial success.

English
machine-
printed
goods.

The most enlightened manufacturers (and, happily, now the number of such is rapidly increasing) are fully alive to the money results produced by the employment of the best talent and the largest experience in the design of common goods. It is therefore to me a matter of regret to observe in one case only, amongst these manufacturers of cheap but very good paperhangings, the execution of really fresh and tasteful designs. The house of William Cooke and Co., of Leeds, exhibits a series of 24 original designs, founded on different flowers and plants, amongst which many are very good and few altogether unpleasing. The treatment of the hop, the hawthorn, and the anemone are particularly agreeable to the eye both in form and colour. The Chinese primrose also makes a very pretty delicate diaper.

W. Cooke
& Co's.
good de-
signs.

When we turn from the display of this firm to that of other manufacturers, we find that the designs of the latter (many of them, particularly those of Mr. Potter, beautifully executed) are of three kinds—the best being reproductions of common French designs of second-rate quality; the second best, imitations of old stock block-printed papers; and the third (which are happily exceptional only) are of that disagreeable class of shaded semi-Gothic panelling and endless repetition of bad little landscapes which were so pungently ridiculed by Pugin and condemned by a most just verdict to the celebrated "chamber of horrors" in Marlborough House. It is strange that amongst the least successful of these papers the colour green, which is usually most tranquillising to the eye (as being the complementary to red, which is irritating) should be the very one least successfully

Messrs.
Potter of
Over Dar-
wen.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

His merit
for perseve-
rance and
ingenuity.

Prospects of
this branch
of the
trade.

French
paperhang-
ings.
Progress
made dur-
ing the last
twelve
years.

used. The error made usually consists in attempting to harmonize the vivid arsenic green by "powdering" it, as the heralds would say, with dark red diapering. This only serves by its contrast of colour to make the green more green, and by contrast of intensity to make it more vivid.

While thus criticising these cheap papers under their art-aspect it would be throwing away a just occasion for national congratulation to fail to take credit for the strides we have made in bringing their production to a very high pitch of commercial excellence. In spite of our high rates of labour I am assured that we manufacture these papers cheaper and in far larger quantities than does any other country, and that the problem of multiplying colours, even up to thirty in one machine, in which the "registry" of tints is perfectly maintained (as has been done by Mr. Potter) is one as yet quite unrivalled out of England. This perfection of "registry" has been obtained, to a great extent, by abandoning the use of heated rollers to force the drying of the printed tints, which was found to so distort the paper as to cause it to drag "out of register," and by adopting the system instead of carrying off the continuous paper to great distances on "friction rollers," so as to give it sufficient time to dry in a natural way between each imprint. The chief difficulty which still remains to be overcome in the production of these machine-printed papers is to get a sufficient "impasto," or "body," printed on the surface of the paper. At present, even the best look a little unsolid and "tinty." This unpleasant impression would virtually cease if the manufacturers of this class of papers would only make a style of patterns for themselves suitable to their means of execution, and not continually invite invidious comparisons by their imitation of the best class of block-printed goods.

One is the more anxious that machine-printed goods should be made artistically agreeable, since there is reason to fear that before long their relative cheapness will drive the block-printed hand-worked papers to a great extent out of the market. The machine-printed papers are already beginning to monopolise the export trade.

Having thus hastily surveyed the English paperhangings, it may be well to take stock of those of the French, noticing, by way of preface, the general characteristics of French progress during the last 12 years, as summed up by M. Aimé Girard in the official catalogue—viz., 1st, the development of the processes of mechanical printing and constant improvements in connection therewith. Limited at first to the use of three or four colours, this mode of production is now employed successfully in the execution of papers and borders

involving the employment of from fifteen to twenty colours. 2nd. The recent introduction and immediate general adoption of a mechanical method of laying on the ground tints for paperhangings. 3rd. The invention of several new "styles," such as struck and gilt flocks, imitations of leather and of silk damasks. 4th. The application to paperhangings of certain new colours, such as the series derived from aniline, the substitution of "guignet" green for arsenic, &c.

The great house of Zuber is not as successful as usual in its *pièce de résistance*, but in its ordinary trade papers there are both successful novelties and a very even level of excellence. The imitations of cretonne chintz hangings are now so close to the originals as quite to deceive the eye at a little distance, and their engraved gold ornaments, the fixing and burnishing of which are produced by heat and pressure, after the fashion of bookbinding, on "moire antique," dead, and stamped morocco or "maroquin" grounds, are of the cleanest and most perfect description. The house of Balin, formerly Genoux, in some of their reproductions of stamped leather by paper worked in relief, have obtained a novel and very rich effect, by floating over a white metal pattern with different coloured transparent lacquers, producing the effect of different coloured metals. Their stamped goldwork is no less good than that of Zuber. Torquetil Malzard, Isidore Leroy, and Gillon Fils, and Thorailleur, all lend themselves to that scale of "tons neutres," or low-toned tertiaries, now so popular and monotonous in France, the first named being the only one of the three to break through the tiresome cold feebleness of the rest with a very cleverly-executed imitation of a padded yellow silk moire antique hanging. This sombre style finds, unfortunately, imitators everywhere (except in England, happily); and in Holland the exhibit of J. H. Rutten, of Maestricht, is influenced by its foggy dulness.

The houses
of Zuber,
Balin,
and others.

Some of the best paperhangings manufactured out of England and France are shown in the Swedish department, by C. A. Kaberg, of Stockholm. It is not a large, but it is a very good display, one of the specimens being an entire novelty, in the shape of an imitation in relief of padded silk wall-hangings. In this the raising of the padding and the folds of the silk, as it is gathered in and bound by small coloured glass studs, are produced in relief by pressure, as in the imitations in paper of stamped leather, and the colour is applied to this surface. At a very little distance the illusion is complete. However unsatisfactory such illusions may be in point of principle, they still (when successful and novel, as this is) indicate power on the part of the manufacturer which

Swedish
paperhang-
ings.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Use and
abuse of
"novelty at
any price."

only needs judicious direction and control to be made profitable to himself and honourable to his country.

The use of such "tricks upon travellers" as paper, printed, or painted hangings with armorial bearings, imitating silken banners, which decorate the department in which Mr. Kaberg exhibits, is justifiable only when successful, and in such a case at least a happy end alone can sanction the means. What may be easily excused in the theatre becomes unpardonable in the palace, and what "my Lady" may delight in as mural millinery to set off her fair person in her own "snuggery" would be out of place and "ridiculous" in "my Lord's" saloon.

In decoration, where the fancy is as "free" as it is in the choice of a paperhanging, it is well to remember that "many men have many minds," and the *arbiter elegantiarum* who may have to dictate as to what may or may not fall within the canons of propriety will do well to make his canons sufficiently elastic to take in a wide diversity of taste and practice. Thus, it should be remembered that much is lawful on a small scale which would be unpardonable on a large one. From Esop's lapdog and donkey to the present time prettinesses in little have been tolerated, which have become overwhelmingly vulgar when magnified.

'Motives' of ornamentation which may be pardonable on a small scale, inadmissible on a large one.

Who would be stern enough to declare what ornamentation may not be put upon a fan? It is far easier to define what would be intolerable in a Church. As old Blondel, with the tact and grace of the "ancien régime," declares, "C'est dans la decoration des petits appartements destinés au développement de l'esprit que l'on peut seulement s'abandonner à la vivacité de son génie à l'égard des ornemens." So it is that upon the walls of a boudoir, as we have already hinted, much may be permitted which would be repugnant to good taste in a larger and more public room. For such occasionally may be used with good effect the clever imitations of lace over damask which were such popular novelties a few years ago, and of which some very clever specimens are still shown by the best French houses. As novelty is obviously one of the greatest charms of such *colifichets*, and as novelty in this case has "lost its gloss," no excellence of manufacture will bring these goods again into vogue until another generation may arise to whom they may still be *nouveautés*. Their place has to some extent been taken, upon the present occasion, by such imitations as that we have noticed, by Mr. Kaberg, and others of cretonne chintzes. These have been very satisfactorily executed by French exhibitors, and it would be difficult at a very little distance to tell the original from the imitation. Of course

the idea of imitation is not an agreeable one, savouring of the "sham" system, but, forgetting for a moment that any such things as cretonne chintzes exist, there is no reason, I consider, why the majority of these papers, when hung, should produce any other than an agreeable effect.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

The cretonne chintz patterns are generally of three classes, ornaments relieved with light and shade *en camaïeu* in a bold "blotch" style on a ground of colour; small figures and ornaments generally engraved similarly relieved, but in a very minute and hard style; and bold, conventional flower decorations, imitated, to a certain extent, from old Persian and Oriental faience. The first of these styles may be tolerated in paperhangings, although it cannot be denied that any strong announcement of *jour à gauche* or *jour à droite* is extremely difficult to deal with in a room, the walls of which may be lit from both right and left, or in which the lighting by night may exactly reverse the lighting by day. The second is not agreeable, but the third offers little or no difficulty, the shading, if introduced at all, being merely conventional and blending into modification of local colours, and furnishes a new and really very elegant style of paperhanging. The chief drawback to this is, that the vivacity of the patterns is generally too great to allow of the satisfactory exhibition of pictures when suspended upon them, unless the pictures are upon a large scale, and the vivid ornamentation either upon a comparatively very small one, or when that "vivid ornamentation" is relieved upon a full-toned ground, assimilating in vigour to the general tone of the ornamentation.

Clever imitations of Cretonne chintz patterns.

It is singular that in these days, when such extraordinary enthusiasm is shown, both for the study of ceramic art and for the collection of beautiful specimens of it, the paperhangers should have only manifested a very limited inclination to imitate styles of ornament which this study and this rage for collection have made popular. Many of the Oriental vases, the Persian dishes, the Moorish azulejos, the majolica "tondi," the old Nankin beakers, and the various "faïences" of different ages and countries, offer fresh and lively "motifs" for borders and diapers, and even for complete wall decorations, in which the conventionalities are most happily treated. They are, however, as yet to the paperhanger almost virgin mines. So, too, much to my astonishment, is the art of illumination. It is only necessary for the student to go into the galleries of the "history of labour" and look over a few of the contributions in the shape of splendid manuscripts with miniatures, exhibited by M. Firmin Didot, the Duc d'Aumale, M. Dutoit, and

Suggestions as to value of decorative models derivable from Ceramic art.

and illuminated MSS.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

French floral
paperhang-
ings.

Imperative
necessity of
the design-
er's special
proficiency
in "gou-
ache" or
body colour
painting.

Such profi-
ciency rare
in England
but common
in France.

other distinguished collectors, to put himself into a position to recognize the admirable sources of inspiration which they supply for painted decorations of any kind or style.

The description of paper in which the French have long enjoyed a supremacy over all other nations has been one in which flowers, sketchily and delicately tinted in a highly conventional manner, and yet one so contrived as to appear free and without artifice or restriction, have played the principal part. When the process of block-printing, by means of which all the best class of paperhangings are produced, is considered, it will be of course obvious that each colour must be printed separately, as in chromolithography; but with this essential difference, that, owing to the vehicle (size and whiting) which must be used by the former process, each colour or tint must stand or fall by its own separate quality on a paperhanging. By the latter process, on the contrary, with its oil and varnish vehicle, transparent colour can be brought upon transparent colour, and all the effects of "glazing" in a picture can be obtained. This necessity for each colour to "tell its own tale," without blending with underlying tints, obviously limits the range of palette, by which effects must be produced, and considerable skill and experience are required to pre-determine what shall be the precise tints used, so that a limited number shall produce a fair approximation to natural pictorial representation. With such restrictions, to aim at the same powerful rendering of imitative art which would be easy with even the same number of mixed transparent and opaque pigments, susceptible of gradation by dilution, would be obviously ridiculous. The designer is therefore bound to adopt a modified mode of blotch painting in a lowered key—i.e., one in which all the tones are made to agree amongst themselves, although the whole pictorial result does not agree with the luminous vivacity and variety which may characterise the group of objects the designer may select for representation. To form, or work in, these artificial or conventional scales of colour successfully demands careful training and long practice, and is not to be done by the most accomplished artists without experience and special education. With us this training and experience are as yet but little gone through and acquired, while in France there exists a traditional school of what are called "dessinateurs," who find constant employment in making patterns in all sorts of keys and scales of colour for fac-simile reproduction by manufacturers. In England as yet we have no corresponding class, and, although in the schools of design the advanced pupils generally pick up some little dexterity in this direction, their practical training

is not to be compared with that which every apprentice in the atelier of a professional "dessinateur" acquires in Paris or Lyons. The result of the two systems is manifested the moment we attempt to trace out the authors of the chief decorations in England and in France. In the former country, the manufacturers of paperhangings in want of anything beyond the simplest current goods have had to address themselves to architects, or to persons who have received an architectural education—as, for instance, Messrs. Jeffries to Mr. Owen Jones (who is well known to have some years ago revolutionised Messrs. Townsend and Parker's business); Messrs. H. Woollams to Mr. Robinson, of Leamington, for mediæval papers, and to myself for their Renaissance decoration in the present Exhibition; Messrs. J. Woollams to Mr. Collman; and I think, Messrs. Cook, of Leeds, to Dr. Dresser. On the other hand, the manufacturers of the latter country (France) have procured all their special designs from painters or "dessinateurs," whose chief, if not sole, business it is to make patterns for this branch of trade—such as MM. Dumont, by whom the great decoration of the Maison Balin (successors to the well-known firm of Genoux of Paris) has been designed; Wagner (long the chief designer for the house of Defossé), who has so successfully directed the productions of the great factory of M. Zuber, at Rixheim; and Aidan, whose design for a Pompeian paperhanging decoration in the gallery of industrial drawings is in the highest degree meritorious.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

In turning to the productions of other countries than those to which I have already alluded, we find that Vetter and Co., of Warsaw, show some papers of poor execution, so far as imitation of common French papers goes, but some of the patterns, which are more or less founded on Moorish examples, have a good effect of barbaric colour. The company of Camuret, of St. Petersburg, has some fairly-executed imitations of common French papers. Two patterns, with aneline dyed flocks, are effective, and have a certain novelty of aspect.

Russian
paperhang-
ings.

In Austria the great house of Spoerlin and Zimmermann, of Vienna, make only a small exhibition, but at the same time one quite large enough to vindicate their position as extensive and good manufacturers. Their diaper, mainly on a turquoise-blue ground, is very pretty, and in point of liveliness of manufacture nothing need be better than their flower-paper on a neutral ground. It is, I think, to be regretted that this pattern was not printed on a white or light yellow ground, in which case it would have presented the aspect of an admirable hand-painted Chinese paper. While

Austrian.

MR. DIGBY
WYATT
ON PAPER-
HANGINGS.

Fancy
papers and
decorative
stationery.

commenting on the gay and cheerful fancy shown by Messrs. Spoerlin and Zimmermann (who appear as the only German makers of paperhangings of any importance) in these specimens, it is but right to dwell upon the wretched taste with which their hangings have been mounted; one in Gothic oak panelling, imitated in paperhanging of the crudest and most cutting chiaroscuro, and the other in a framework, one-third Chinese, one-third Moresque, and the remaining third in some indescribable style, agreeing with neither of the other two. The small marbled and ornamented "papeterie" of the house is too well known to need comment, as, indeed, is that of the house of Knepper, also of Vienna. These two manufacturers were also keen rivals in 1862 at London. In such fancy papers, *i.e.*, papers with artistic designs, the Germans show much better than in the article of paperhangings, especially through several Bavarian houses, and notably those of Haenle, of Munich, and Stern, of Furth. Such fancy papers, which are also admirably made at Paris, are much used for wrapping up sweetmeats, and in the "jour de l'an" offerings so universal on the Continent, the value of the case or wrapper often exceeds that of the object so elegantly enshrined. In England the fancy paper trade is greatly sustained by the annual "Valentine" fever, which, though of short duration, consumes a very large quantity of the most elaborate stationery made in any country in Europe. The prevailing fashion, I might almost call it rage, too, for monograms, embossed, "illuminated," and especially "eccentric," both for use and for collection, has also tended to the production of greatly improved artistic designs for ornamenting letter paper. Unfortunately, few of these were shown. The British section had also to mourn the absence of Messrs. De la Rue, who on other occasions have maintained, I believe, an undisputed ascendancy for England in every branch of this elegant form of the application of art to industry.

Painted
blinds.

Gradual de-
cline of the
trade.

The painted blind trade has apparently suffered from the great increase in the supply and concurrent reduction in price of stained glass; for many of those staircase or passage windows which used to be covered with ornamental blinds, which, however pretty while new, always looked shabby and discoloured after a year or two's wear, good and permanent screens in glass are now put up, requiring no subsequent attention or removal, and often presenting very agreeable decorative effects. On looking over the specimens of "stores" or painted blinds in the Exhibition, one cannot fail to notice, firstly, that there are not so many as usual heretofore; and, secondly, that those which there are are not so

good. The truth is that painted blinds have gone out of fashion, and as there is little or nothing special in the process of their manufacture success or failure entirely depends upon the talent of the decorative painter who ornaments them. If it pays to employ a first-class hand, the screen is good, and if the decoration is left to a second-rate one, it is poor, and simply repeats, in another form, the current exaggerations and commonplaces of vulgar decoration. Apparently the French have not thought it worth while for this Exhibition to employ any of their most dexterous talent, and thus it is that the German specimens, except in flower painting, are rather better than the French. The real and proper use for such blinds is to give a hasty decoration only to a building erected for some temporary use, as in fact they have been made to do in the British section, in the large windows of the machinery department, where they tell a good series of stories in a very clever way. There is little to be regretted in the decline of a branch of industry supplanted by one of greater excellence and permanency. We may therefore, to a certain extent, bury the painted blind business without many tears or much lamentation.

A retrospective glance over what I have now written on the products of Class 19 justifies my confidently asserting that the balance of excellence hangs tolerably evenly between France and England in this department. It may probably incline in favour of the former country in so far as the perfect execution of the most elaborate class of goods may extend, but on account of the signs I recognize of present healthy commercial economy of production, combined with vigour, activity, and good taste at home, as well as abroad, I entertain no fear for the immediate future of British industry in this section.

In conclusion the author looks hopefully and cheerfully on the state of the paperhanging manufacture in England.

REPORT on GOLD and SILVER PLATE.—(Class 21.)—By
G. J. CAYLEY, Esq.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

GOLD and Silver Plate, the central subject of this classification, divides itself on each side from its kindred and contiguous industries, jewellery and bronze work, by somewhat indefinite lines of demarcation. Cups in crystal, sard, or bloodstone, set in gold and enriched with precious stones, would seem to be rather a larger form of jewellery than plate proper: while the gilt and silvered statuary vases, centrepieces, candelabra, &c., sculptured in gilding metal, might range themselves more appropriately under the category of the bronze-worker than the goldsmith. The distinction seems to be drawn here not from any difference in method of manufacture, but with reference to the destination of the objects exhibited. The drawing-room decorations, in however artistic and highly-finished gilt and plated metal-work (often rivalling, if not excelling, the silversmith's), belong to the bronze department;* while all that relate to the decoration of the dining-table, and to eating and drinking, even though they reach as huge proportions, and are equally made of gilt brass, are classed with plate.

What is
plate?

Again, although the merit of plate would appear to depend much more on form than on colour, the enameller, in whose art all the delicacies of the most elaborate miniature-painting go for much more than sculptural form, enters into direct competition with the goldsmith proper. Then the ecclesiastical goldsmith stands between the two, mingling enamel work with sculpture and architectural forms; so that to judge, under the same category, of the relative degrees of excellence in the chef-d'œuvres of Morel Ladeuil, Le Pec, and Armand Calliat, is very analogous to an attempt to range in sequence of merit the

Difficulties
of classifica-
tion.

* Barbedienne, though not competing in class 21, has some exquisite pieces of silver plate; a vase, beautifully embossed with bramble leaves and fruit in high reliefs, and a pair of Louis Seize candlesticks should be looked at. He has also a cup in copper, parts of which are interchanged with solid compartments of silver and gold (observe the inside to understand the construction), and a copper casket massively incrustated with the precious metals. These two extremely novel and original works of the most costly kind belong to class 21, but the jury's attention was not called to them, as the whole of the Barbedienne exhibit is in class 22.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Le Pec's
enamels.

Venus of Milo, the Parthenon, and Raphael's frescoes in the Vatican.

The first prize in Class 21 has been adjudged to M. Le Pec. His enamels are of the highest merit, especially where miniature portraits are surrounded by rich decorative discs of variegated colouring. M. Le Pec has made numerous and valuable discoveries in the manipulation of metallic colours, which, changing, as they do, under the fiery ordeal of fusion at very high temperatures, require vast patience and perseverance, added to great artistic faculties. His main works are on pure gold, which resists a very high temperature in the fire, and being unoxidable, leaves the pigments unaltered by any metallic result of combustion. Copper, which will bear as great a heat without melting, nevertheless loses substance in the fire, and of course has a tendency to dull the colours laid upon it by an excess of copper oxydes, which cannot be easily allowed for and calculated on, as the piece may have to go into the fire an indefinite number of times.

It seems a pity, considering the value and beauty of the substructure, that so little of the fine gold appears on the surface of M. Le Pec's work, or even shows through layers of transparent enamel. M. Le Pec's system is to overlay his whole ground with a coat of white enamel,* and to paint on this white surface with mineral pigments, burning in successive tints in the relative order of their points of fusion, beginning, of course, with those hardest to melt.

It is sometimes objected to M. Le Pec's work that many of the pieces scarcely distinguish themselves from porcelain, from the want of portions of the gold underneath cropping out, as they might do with good effect and contrast in sculptured borders and medallions, showing by their wrought surfaces that they were of genuine gold and not porcelain gilt, and thus declaring the structure to be metallic.

To this M. Le Pec replies, that in his earlier works it so often happened that the metal collapsed in the fire, that it would have been extremely hazardous to make a great outlay of labour in sculpture which might be lost in the accidents of enamelling; but, as his skill has increased with experience almost to certainty, he is venturing more and more on sculpture in bare gold to relieve his coloured work. This, of course, has all to be done previous to the first layer of enamel, which would crack at the touch of the hammer.

* This absence of glazes translucent to the metal very much, if not altogether, does away with the value of gold as a ground.

His latest and most considerable work, the *nef* which surmounts his collection, exhibits several golden statues in repoussé, embowered in scrollwork of enamelled metal far too thin and delicate to be possible in ceramic manipulation.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

This *nef*, somewhat resembling in shape a nautilus-shell, being unmistakably metallic in structure, is the sole justification of his position as heading the list of eminence in *orfèvrerie*. No one would have begrudged him a unique pre-eminence among enamellers, but surely, in goldsmith work proper, enamelling should be the accessory which enriches the goldwork, instead of goldwork being the accessory which relieves the enamel. That gold is the material used as a substructure is a mere detail of convenience in the manufacture, unless the gold be in evidence, and the merit of the work mainly sculptural. There is much merit and grace in the sculpture, but it is chiefly worked separately, the figures being set on the two ends of the *nef*. There are some mouldings, but no considerable masses of gold sculpture in the main body of the cup, and the figures are made to appear more closely embodied in the unity of the enamel-work than they really are by the graceful coils and spirals of enamelled scrollwork and foliage which surround them. Mr. Le Pec's stand is opposite the French plate court, in the central street, which forms the short axis of the oval building.

Le Pec's
nearest ap-
proximation
to plate
proper.

The next on our list is the collection exhibited by the Brothers Fannièrre, which, besides its high order of artistic merit, has, like the previously mentioned works, the extremely rare peculiarity of being the work of the hands of the exhibitors themselves. The brothers Fannièrre, pupils of Antoine Vechte, from being art-workmen in the employ of others have risen, by their talent and industry, to an independent commercial establishment, and in this exhibition carry off the first gold medal awarded to silver plate.

Fannièrre's
repoussé
sculpture.

Their *specialité* is a very high perfection in repoussé sculpture. Two shields, one in iron and one in steel, are the most remarkable of their works. The latter, being unfinished, is not shown unless inquired for, but is the most striking of the two. The amount of relief is greater than has probably ever before been attained in the material, and, as steel is not a tractable metal, it is deserving of attention not only for its great artistic merit, but as defining the limit within which bold embossing, almost amounting to alto-relievo, retains its genuinely metallic character.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Silver and
steel as
materials for
embossing.

Raison
d'être of
highly
wrought
plate, adver-
tisement not
profit.

Suggested
compromise
between
art and
trade.

Silver, if it be burst by forcing it into a relief beyond its powers of expansion, may be patched up by soldering in new pieces neatly enough to escape observation unless the back be carefully examined, and even the back may be so cleaned up by files and rifflers as to show no seam. There are a pretty pair of saltcellars—bivalve shells, surmounted by statuettes of Neptune and Amphitrite; a fine model of a clock, not yet finished; and other works, all of which have a vigorous and original character.

Collectors of artistic plate would do well to secure some work of Fannièrè's. This kind of plate has been stimulated artificially of late by an æsthetical demand for high art, which critics eulogise, but the public do not practically pay for at a price to make the production of such things a commercial success. The works of Vechte and his two most eminent pupils, Morel Ladeuil and Fannièrè, will in all probability make an epoch in silver work. If it were not for their value as an advertisement to the firms who employ these artists, at a much greater outlay than the prices obtained for their work can cover, in order to attract favourable criticism at exhibitions, this sort of industry could not exist at all. Nothing lasts long which is not a genuinely sound commercial transaction in itself, and this will probably decline when the world is weary of exhibitions. In the meantime, these highly-wrought pieces of plate, though too dear for the general public, are worth, in labour expended and beauty realised, more than the prices asked for them, and will no doubt rise in value when the artists who made them are dead and gone.

It is a question whether high-art sculpture is practically an appropriate form of ornament in plate, which, if used, is liable to bruises from all the natural shocks which dinner and tea trays must encounter; and if not used, might just as well be statuary on a small scale, unencumbered by an unnecessary adaptation for holding salt, sugar, tea, coffee, or claret. It is very probable that art might be better applied in making the ordinary services of the table as effective and as artistic as they could be made at a purchaseable figure by bold conventional decoration, vigorously conceived and carefully designed, with a view to rapid and trenchant re-production in quantities, after much thought had been devoted to the original. As it is, the chefs-d'œuvre now produced by exceptional art-workmen do not seem to re-act at all favourably on the style of ordinary plate, which remains as vulgar as ever, and is sold at a

remunerative profit to a tasteless public, attracted by the reputation of unsaleable art-treasures.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Christofle's
exhibit.

From Fannières' stall it is but a step to look at a charming little set (coffee-pot, cream-jug, and sugar-basin) which might easily be overlooked in the gorgeous pomp and panoply of Christofle's show. It is worth all the galley freight of allegorical municipal impersonations, and all the surrounding shoal of river gods and goddesses in many tinted gold. It is the cream of silver work, creamy in colour from some delicate light patina, which is a trade secret.* Most oxyded silver is dull, dark, and leaden: but this has a soft lustre, like a pure white cloud just touched with a primrose glow of sunrise. It is not ambitious in sculpture, but delicately adorned with crisp small foliage and choice mouldings. Here and there is a little redundance of ornament—a festoon or so of flowers that might have been dispensed with; but, on the whole, it is the most covetable little coffee-service in the known world, and costs the mere trifle of 2,000f. But any rich plate-fancier whose life is good enough to give him a fair chance of drinking 2,000 cups of coffee out of it might find it well worth his while to give tenpence a day extra for his breakfast for five or six years, if a thing of beauty be a joy for ever. Near this coffee-set there is a tea-service, which is quaint and grotesque rather than beautiful. Four elephant-heads support the body of the urn (out of which they issue) on the ends of their trunks. Now, a trunk is a pliable form of power, good for lifting, but not for propping. The tea-service stands on a table, in which the copper of which the slab is formed serves as a ground, on which incrustations of gold and silver form a pattern. The value of the copper ground in setting off the gold and silver is much greater than would have been anticipated. It will probably improve as the copper gathers its patina by age. There is also a pretty little tea-service in white, blue, and green cloisonné enamel. In this exhibit there are quantities of purely commercial plate, quite uninfluenced in design by the firm's best artists. As novelties, mention may be made of silver services, engraved by aquafortis and electricity: the last a curious process, and said to be cheap; but the result is rather hard and wiry, like a spotty pattern on harsh woollen poplin. Christofle, being a juror, is not a competitor.

Engraving
by electri-
city.

Next to Fannière in award of merit, and opposite

Odiot's
plate.

* Said to be a very slight electro deposit of gold partially rubbed off, and leaving the colour mainly in recesses of the work.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Effects
which must
disappear
by use un-
satisfactory.

Dead white
and burnish
alike un-
suited to
sculpture.

Elkington.

Morel La-
deuil's Mil-
ton shield.

Christoffle in the court, is Odiot. His chief pretensions are founded on three fine pieces of massive plate, which in some way celebrate the Creusot Ironworks—square-shouldered, beetle-browed smiters of blooms and forgers of anvils, seated about the feet of the centrepiece and candelabra, hold great weapons of Vulcan and unfinished bits of machinery, as if resting from their labours. There is a good deal of originality in the style, and skill in overcoming the art-difficulties of disposing cogwheels, piston-rods and cranks so as to be ornamental rather than otherwise. The general run of Odiot's plate is not sufficiently remarkable to justify his high place. It is rather heavy in design, and is not improved by a mixture of oxyde with dead white and burnish. All artificial tints, even if they were pretty to begin with, are objectionable as being incapable of enduring the wear and tear of use; and honest work should be brought as near as possible to the appearance which it can maintain.

A great deal of both French and English plate is disfigured by this violent contrast of dead white picked out with burnish. Neither condition of surface is favourable to the exhibition of form. The white takes scarcely any shade, and the burnished surface reflects other colours too much to show either its own colour or shape. The best surface for sculptured silver is smooth but not polished, with a delicate open fretwork of cross hatchings, formed by short chisel-marks, which produce the effect of a delicate grain.

In Elkington's exhibit, which is classed next to that of Odiot, there is an eminent example of genuine and natural manipulation of silver, accompanied by the highest merit of sculptural design and execution, in M. Morel Ladeuil's Milton shield illustrating "Paradise Lost."* The form of this noble work is a graceful oval. An outer and inner framework of gold-incrusted and repoussé steel enchases three silver compartments, of which the central disc rises to much higher relief than the surrounding sculpture. The result is beautiful and harmonious, both as to surface and colour. For this work the jury of class 21 have recommended the artist as justly meriting a gold medal.

The table presented to the Princess of Wales by the ladies of Birmingham is another great work of Morel Ladeuil. It is not new to the English public, who admired it greatly at the Exhibition of 1862, when it was seen to

* Illustration published in the Art Journal Catalogue of the Paris Exhibition, p. 217.

much greater advantage than it is now ; for the loyalty of the ladies of Birmingham has disfigured its base with some gold and enamel escutcheons ; and the unæsthetic industry of the housemaids of Marlborough House or Sandringham, to whom the soft tints of the sculpture seemed too dull to be ornamental, has considerably damaged its superficies by vigourous application of emery or rottenstone. There are also some pretty ewers and plateaux by the same hand. Elkington's next most important work is the international trophy designed by Willms, which has great merit, but wants movement. Four furled flags, forming the centre, are uniform and stiff. If one or two of them had been unfurled, and has shown a little consciousness of wind, and if the figures seemed to be doing something, and the horses and oxen appeared to be going anywhere, though all the items are very well modelled, the result would have been more striking. On the whole, this is not quite equal to Odiot's Creusot pieces.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Trophy by
Willms.

The International Elcho Shield, the model of which seemed very promising a few years ago, has been terribly vulgarized in the execution. All workmanlike genuineness of texture has been lost by an application of cheap and common acid-bitten engraving in stiff and vulgar diaper-work where the level surfaces ought to have been enriched by the hammer and chisel with some deftly-interwoven design of roses and thistles congenial in design with the hexagonal scheme of the shield. Instead of being, as the model promised, a noble piece of iron repoussé, it has all the character of ornamental cast-iron work usually employed in decorating fireplaces and fenders. If this shield had been executed as the model promised, Elkington would in all probability have been placed before Odiot—that is, if the best of what the firm possessed had been set out to advantage, instead of being crowded higgledy-piggledy into a corner in order to show a mass of electroplate, which acts merely as dead weight to be floated by their works of art.

Want of
selection
and crowd-
ing detract
from the
award to
our best
exhibitors.

Hunt and Roskell also damaged the position which the really magnificent objects they exhibit must have forced from the jury if unencumbered and unobscured, by crowding their space with much that had better have been left at home. The great Breadalbane candelabrum, by Vechte, the finest thing of its kind ever produced, with the platinum missal-cover made for the Duc d'Aumale, the large gold medallion made for Cardinal Wiseman, and the Ellesmere vase, by the same artist, along with some of the best

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

High art
found prac-
tically un-
profitable.

Church
plate.

specimens of Armstead's rather unequal, but, in some instances very characteristic work, together with a well-selected sample of the firm's polished* (not burnished) plate, which is far better in its kind than any France produces, might, if skilfully arranged, have eclipsed all competition. But these gems of art and samples of excellent manufacture were elbowed out of place and stared out of countenance by glaring heaps of snow-white stags and unattractive metal of every shape. The growing merit of some of the younger artists in Messrs. Hunt and Roskell's employ receive and deserve honourable mention—Messrs. Barret and Carter in modelling, and Mr. Holliday in steel repoussé; but there are no very important additions to the works exhibited in 1862. The fact is, that this firm, having spent enormous sums of money on very high-art workmanship, do not find the British purchaser's taste correspond with the theories of the art-critic, and appear content to rest on the European celebrity they have already obtained. The jury confirm and renew by "rappel" the great gold medals of honour obtained both by Hunt and Roskell and their principal co-operator, Vechte, in 1855, to which, according to the theory of the Imperial Commission, a new medal in specie, coined in 1867, could add nothing but its weight in bullion.

Armand Calliat and Poussielgue are two rival firms in ecclesiastical plate. The former has made great progress of late in rich combinations of gold, silver, and enamel work for croziers, ostensoirs, shrines, pyxes, crucifixes, and all the paraphernalia of Roman Catholic worship. There is often much taste and harmonious softness in his specimens, qualities by no means easy to unite with lavish variety of gorgeous colours. Poussielgue has been much longer before the public, and has made less effort for this exposition; his style is more solid and less richly ornate. He has, moreover, had the advantage of the inspirations of M. Viollet le Duc, some of whose designs, executed by Poussielgue and Bachelet, should be looked at by our manufacturers of church brass-work.

* Polish is produced by rubbing the surface with a succession of cutting powders, getting finer and finer in grain, till the polisher finishes with rouge applied by the hand. Its principle is wearing down inequalities in the surface. Burnish is obtained by applying strong pressure and friction of a brilliant surface in steel or agate to the smooth metal. This pressure consolidates the grain of the silver, and reproduces by contact the surface of the tool on the object to be brightened. But the force used has a vibratory action, which marks itself in the tremulous reflections seen in burnished plate, while the gentle rubbing repays its greater labour by an even soft repose of surface.

Froment Meurice shows a large and very handsome collection of high-class plate. Handsome is the word which best expresses the character of his work. His art, where sculpture enters, as it does rather too copiously into his larger pieces, is not of the first order, but his plate is solid, highly finished, and effective, from a smooth luxurious richness of quality which eminently fits it for aristocratic use. Now, the practical purpose of plate being rather to furnish the tables of the rich with handsome and serviceable silver than to provide art-treasures for the cabinets of collectors, Froment Meurice, from this point of view, seems to deserve a higher rank than he has received, while Odiot has been somewhat overrated. Odiot's great Creusot pieces are certainly finer than anything of the kind in F. Meurice's exhibit, but Froment Meurice quite as decidedly surpasses Odiot in the variety of design and excellent execution of plate proper as distinguished from monumental and art-treasure works in silver.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.

Froment
Meurice, the
Hunt and
Roskell of
Paris.

Hancock has a vast display of massive and costly cups, vases, and candelabra, most of them modelled by the sculptors Monti and Armstead. Many portions of the modelling are very fine in themselves, but the construction and composition of the pieces are usually unmetallic in character. Many of them would look as well or better if carved in marble.

Hancock.

To have the metallic character of ornament, a vase should be designed by a metal-worker who knows, while he is moulding his wax, that the form will have to be got out of a flat piece of metal, so that his design is modified by the difficulties or impossibilities he foresees. Casting has no difficulties that may not be overcome. It is sculpture, pure and simple, with even more freedom than is afforded by marble, where the fragility of material limits the fineness of the carving and undercutting. Freedom becomes dangerous when the characteristic qualities of an art have established themselves under limitations.

The metallic
character in
plate.

By employing cast-work, instead of repoussé, the artist not only encumbers himself with a dangerous liberty in design, but deprives himself of a tentative freedom in execution. The thin tough sheets of malleable rolled metal in which repoussé is executed can, within certain bounds of tension, be pushed from the front or the back, till the form satisfies the artist's eye. The cast-work can only be chiselled and filed from the outside. It is too thick, and often too crystalline in texture, to bear hammering out from within. Besides metals—especially

Casting as
compared
with em-
bossing.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.
—

the precious metals—shrink a great deal in cooling, and therefore come out of moulds they are cast in, smaller than the model moulded from. This shrinkage often leaves flaws in the casting, holes or spongy places which have to be patched up. In short, the metal which has been cast is altogether less tractable and less trustworthy than that which has been laminated from the ingot by rollers, or—what is still better—forged on the anvil. The thinner the casting, the more liable it is to flaws; and wherever genuine hammer and punch work can be used it is not only sounder and stronger, but looks better than casting.

Wagner, the principal goldsmith of the King of Prussia, has a pretty dessert service in repoussé, and a very creditable show of plate. He has no particularly national character of work, having studied many years in Paris as a chaser.

Russian
silver work.

Sazikoff, in the Russian Court, has a large display of quaint, semi-barbarous picturesque plate, the design of which is mainly founded on the national cream and butter jars, lidded in silver imitation of coarse white cloth; while the jar is gilt and swathed with rush ribbons in dark oxydised silver. This design, in different sized jars, is adapted to urns, tea and coffee pots, cream jugs, sugar-basins, &c. Among all this dark and heavy-looking work, it is curious to see a most perfect facsimile in silver of a white satin shoe, with a crisp white satin rosette. The mild, pure pearly lustre of the stuff is so perfectly represented, that one can hardly believe at first that it is not satin. One might fancy that the fairy genius of civilization, alighting in this strange barbaric region of art, had fled in dismay, leaving her slipper behind her, like Cinderella. There is in Sazikoff's collection, however, a fine bold piece of embossed sculpture, hammered out of thick silver. This large semi-circular panel set in an oak frame is evidently meant to surmount some inner doorway of a church, or some altarpiece. The model was made by Vitali, recently deceased. Unfortunately, the relief is, in some places too high to be got out of the metal without breaking it, and some of the more prominent figures are wrought separately and soldered on, rapporté, by examining the back the observer will perceive where this piecing work has been resorted to, and will learn what can be done and what can not be done by the repoussé process. The result would certainly have been more satisfactory if the designer had restricted his model within the limits of what was possible without patching the original sheet of metal.

Natural
limits to
relief.

Rudolfi exhibits both in the French and the Danish divisions. He had the merit of popularising a tolerably good imitation of mediæval art in ornaments, and his stall was greatly admired in the Exposition of 1855. His work, however, has not improved since then, and his rather florid colouring and imperfect sculpture have caused his manufacture to decline in popularity and fall a little out of date.

Harry Emmanuel draws crowds to his stand by the performances of a wonderful mechanical swan in repoussé silver. This graceful automaton turns the jointed feathers of its neck so as to curve its head down over its tail with a very natural movement. Then it writhes round again, and, opening its bill, takes up a fish from the turning spiral of twisted glass, which represents running water, the whole being done by some clockwork machinery, which at the same time emits a jangling metallic music of a wild and uncanny sort. The swan is an ancient piece which Mr. Emmanuel has refitted. He exhibits also several shields, some cast and chased, others in repoussé, and four tazza plateaus, all the repoussé work being executed by Pairpoint. This artist, though still a young man, is the best known of English performers in that line. Armstead is more a modeller than a chaser. His works are principally in cast metal, which is chased and cleaned up by other hands, though he gives the last touches himself principally with the riffler.*

Close to Emmanuel's stand some good specimen of parcel-gilt silver are shown by Watherston. Two rose-water ewers and dishes, handsomely chased without ambitious sculpture, very good of their kind, and of a kind which is effective when well designed, while the execution demands only the hand of a good workman.

Wherever sculpture enters, unless the executing hand be that of an artist, the result, however well modelled in the wax, is sure to be vulgarised in the silver. It is, therefore, much safer to keep clear of sculpture, unless it be done by the hand of a master competent alike in wax and metal.

Danger of
ambitious
misapplica-
tion of
sculpture.

It would, however, be probably a much more profitable application of good art for those firms who do possess good metal sculptors to spread their work over a large number of useful pieces of plate instead of concentrating it on large and

* Rifflers (riffloires in French) are curved files, in shape resembling modelling tools, used in finishing and smoothing metal work. The best are made in Paris, by Renard.

MR. CAYLEY
ON GOLD
AND SILVER
PLATE.
—

How to
make the
most of our
art in its
application
to manufac-
ture.

often useless and unsaleable objects. For instance, a claret jug, teapot, salver, and sugar basin, cream jug, soup tureen, urn, or wine-cooler, of good proportions and shape, in perfectly plain polished silver, might be quadrupled in value by some really good bits of sculpture, embossed wherever the constructional features of the piece demanded accentuation.

To work out this hint well, would, I am convinced, make a new era in plate. We have the high art and we have the good workmanship for handsome utility, but we have not yet succeeded in utilising our art by making our serviceable plate artistic within purchasable limits.

REPORT ON BRONZES, and other ART-CASTINGS, and RE-
POUSSÉ-WORK.—(Class 22.)—By GEORGE WALLIS, Esq.,
South Kensington Museum.

MR. WALLIS
ON
BRONZES,
&c.

INTRODUCTION.

IN order to define clearly the scope and purpose of this report, it is desirable that the classification of the industries coming under the head of Class 22, as given on the authority of M. Barbedienne, one of the committee of admission to this class for France, should be quoted:—

Class 22
Classifica-
tion.

1. Artistic bronzes and ornamental bronzes, including statues, statuettes, clocks, vases, decorative candelabra, &c.

2. Iron castings, comprising figures, vases, tazza, fountains, candelabra, railings, balconies, crosses and miscellaneous articles.

3. Imitation bronze (composition), including composition for clock-cases, tazza, vases, candlesticks, &c.

4. Repoussé-work, including figures, vases, ornaments, &c.

5. Galvanised cast iron.

6. Zinc figures and ornaments, statues, statuettes, clocks, vases, &c.

It will be seen that this includes a tolerably wide range of industry, although all bearing, with the exception of the repoussé-work, in one direction—that of casting in metal. The peculiarities and artistic effects to be examined and reported upon are, therefore, one in principle, however much they may vary in detail.

The metallic alloy called bronze varies slightly in its composition in various countries. In France, which is most undoubtedly the leading producer of this class of artistic and decorative works, the principal metals employed are “the copper of Chili, Russia, New Zealand, and Minnesota, on Lake Superior, but the greater portion from Chili; zinc from Silesia and the Vielle Montagne; tin from Banca, Sumatra, and Cornwall.” M. Barbedienne, from whom this statement is quoted, also states that the zinc used in France for the purpose of casting figures, &c., to be afterwards wrought into imitations of bronze by the electro-deposit process and artificial colouring, is chiefly that of the Vielle Montagne.

Bronze as a
metallic
alloy, and
zinc.

The principal countries which exhibit bronzes in the Universal Exhibition of 1867 are France, Prussia, Austria,

Countries
exhibiting
works.

MR. WALLIS
ON
BRONZES,
&c.
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Russia, Italy, Belgium, and the United States of America. England is practically unrepresented in this specialty of Class 22.

The conditions necessary for the development of this branch of industrial art appear to be a knowledge of the principles of artistic design and a love of art fairly spread through the people generally. The exceptional products exhibited by some of the countries quoted, however excellent in themselves, are no evidence that the public sentiment existing in these countries at all approaches what we see at this day in France, and especially in Paris.

Art, the
great ele-
ment of
success.

Partaking so largely of the highest artistic elements of design, the bronze manufacture may be considered a trade only by the extent to which it is or can be carried in the constant reproduction of the same subjects. Beyond its power of extension and the readiness with which the designs and models, together with the proper appliances for repetition, can be obtained in a properly trained community, the manufacture of bronzes and high-class metal castings is in reality a fine art, and depends for its success upon its close approximation to, and continuous connection with, the art of sculpture in its best and most enduring forms. The marvellous reproductions of antique bronzes exhibited in the Italian section of the Exhibition would go far to prove this, even if it were not patent to everyone that the education and training of the bronzist who is to be at all successful in his business, must be essentially that of the artist; for however skilfully the model may be executed, or however perfect the casting produced from it, the fact that the finish must be that of the artist is self-evident.

Method of
this report.

This report must then, whilst treating of manufacturing technicalities, branch off also into considerations of art, and of those principles which govern the production of art-objects in the various materials and by the numerous methods which it will be necessary to examine and treat upon. This will, however, be done more in an explanatory than in a critical sense, in order that the attention of those specially interested in these important phases of human industry and art-practice may be enabled to examine for themselves, when the opportunity presents, the various works and productions it may be thought advisable to single out as illustrations of the present position of the art-manufacture of bronzes and kindred works in metal, as exhibited by those countries which take part in the Universal Exhibition of 1867.

Arrange-
ment of the
works in the
Exhibition
building.

The arrangement and classification of the works in the building of the Exhibition is very far from being consistent with the official programme. In addition to the examples

in Class 22, ornamental castings in iron are placed in class 40, "Mining and Metallurgy;" and bronzes are, as a matter of course, exhibited in Class 3, "Sculpture, &c.," as objects of fine art. The class in which any works specially referred to are placed will, however, be indicated as a key to their position in the building, and works exhibited in the park will be as distinctly pointed out as circumstances will allow.

FRANCE.

The extent to which objects of art in bronze are produced in France is fairly illustrated by the varied productions exhibited, chiefly, as a matter of course, by the bronzists of Paris; as that city is the centre of this class of metal-work. FRANCE.

According to M. Barbedienne, the bronze industry employs about 11,000 workmen, whose wages vary from 3s. 6d. to 6s. 8d. per day, the more skilful and artistic obtaining much higher payment. The value of the annual production of bronzes in France is estimated at 70,000,000f., or 2,800,000l. sterling. Formerly the exports were much larger than they have been of late years. The exports in 1863 amounted to 44,000,000f., or about 1,800,000l. sterling. In 1864 this fell to 40,000,000f., or about 1,640,000l. sterling; the diminution in 1865 being a further amount of 6,000,000f., or 210,000l., giving the total exports for that year as 1,430,000l. sterling. The returns for 1866 have not yet been made up, but it is expected that a further diminution will have taken place. Statistics of
the French
bronze trade.

M. Barbedienne attributes this falling off to competition in England, Belgium, Germany, and Russia, in which countries efforts have been made to establish the production of bronzes for home demands, if not for exportation, thus bringing these countries into a double competition with France. Causes of
decline in
the demand.

I am inclined to doubt this conclusion. Certainly in England there can scarcely be said to be any decided production of commercial bronzes. Our efforts have been chiefly confined to the production of works of a large and important character for public monuments, and, with the exception of one or two houses, the smaller works are not produced at all, and by these houses in very small quantities for home demand only.

From the dates given by M. Barbedienne I should attribute the decline in the demand for bronzes to the civil war in America, as from personal observation I know that a great demand for this class of art-objects had been gradually springing up in the United States for eight or ten years

MR. WALLIS
ON
BRONZES,
&C.
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Rise and
early pro-
gress.

Art work-
men and
art educa-
tion.

Société des
Fabricants
de Bronze,
Paris.

prior to 1861–62. Fashion may modify the demand in some degree, but the production of bronzes in any other country except France is shown by the present Universal Exhibition to be so exceptional, that the falling off in the exports must be accounted for in some other way than by that of foreign competition.

The rise and progress of the bronze manufacture in France are attributable to the almost universal spread of a love of art and decoration during the last twenty years. In 1844, the year of the quinquennial exhibition of manufactures, I visited nearly every bronze foundry in Paris; and therefore can, from personal observation, confirm the statement of M. Barbedienne that it is within the period named by him, in his introduction to the catalogue of Class 22, that this important and interesting industry has had its rise; as also the fact that no important improvement has taken place within that period as regards the materials, tools, or general appliances of manufacture, but that the progress has been entirely due to the development of a knowledge of art and the progressive elevation of taste, not only amongst the workers in bronze but amongst the general public.

As regards the workers, so anxious were the leading men occupied in the bronze trade, about 1843–44, for the proper education of all connected with this industry that they established a school of art* or design, specially for the bronzists of Paris, which received pecuniary assistance from the municipality of Paris, and also from the Government. In this school nothing was taught that did not bear directly upon the pursuit of the student, who must be employed, or intended to be employed, in a bronze foundry or the *ateliers* connected with such an establishment. This school was subsequently abandoned; and of late years the association of bronzists of Paris have given periodical prizes for the best works executed by the rising talent employed in the development of this industry. This association (Société des Fabricants de Bronze) exhibits in a collective form (Class 94, No. 153) the various works to which prizes have been awarded since 1855 for designs, models, castings, chasing, repoussé, and spun work, turnery in brass, bronze, and copper. The operations of this society in the direction named, fill up the void occasioned by the abandonment of the special school; and the system now pursued appears to be the best, as it has the effect of encouraging the attendance of the young workmen in the classes of the various art schools of Paris, and developing the skill and ability acquired both in the school

* Ecole Communale, Rue Menilmontant.

and the workshop, in a practical direction. Thus, the theory of art and the practice of handicraft power both work to the same end. The rewards being given by those who are best acquainted with the special wants of the industry which it is the purpose of that association to foster and encourage, is an important element in insuring a wise and judicious administration of the means at their disposal and justice in the awards; whilst the successful competitors are practically ensured suitable employment by those who require their assistance.

MR. WALLIS
ON
BRONZES,
&c.
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The French bronzes may be broadly divided into two classes:—

The two
classes of
French
bronzes.

1. Those which are designed and modelled as works of sculpture, and owe their interest and value to the higher qualities of fine art, in which statuesque severity of form, expression, and dignity of treatment are combined to produce a given result in the material selected, without factitious aids from variation of colour, gilding or silvering, or combination with other materials.

2. Those which are essentially decorative in character, and which, whilst possessing many of the qualities of those named above, are yet so finished in detail and so varied in their effects of colour, gilding, silvering, and enamelling as to make them ornamental and picturesque, rather than statuesque and severe.

Upon the capacity to produce works in the first class the power to achieve success in the second class must entirely depend. The art education of the bronzist in France is that of the sculptor, and the power thus cultivated is directed to the special manufacture or continuous repetition of designs. The growing demand of the last 20 years has undoubtedly encouraged the development of this kind of art-skill until it has produced an important industry of great national importance, not only in this special direction, but also in the production of works in iron and zinc.

It was easy to see that the skill manifested by the bronze casters and chasers of Paris in 1844 would, at no very distant period, be directed to the manipulation of ornamental and decorative iron castings; although at that period very little had been done in this direction, and the iron trade of France can scarcely be said to have had even an incipient existence. Personally, I regarded the position of the bronze manufacture at that period with a lively interest; not so much in relation to itself as in its probable bearing upon the ornamental iron trade of England. In the present Exhibition we see the very result which everyone would naturally expect after examining carefully into all the

Action of
the bronze
manufacture
on ornamental
iron
castings.

MR. WALLIS
ON
BRONZES,
&C.
—

bearings of this question, in the exposition of ornamental iron castings in which the skill of the bronzist and the artist has been successfully combined with the best science of the ironfounder and trained metallurgist. Nor has the skill thus developed and carefully cultivated failed to re-act upon the practice of the bronzist. The efforts of the latter to overcome what, at first sight, appear insurmountable difficulties in casting art works in iron in one piece, from the fact that the system of "firing on" portions which in bronze can be cast separately cannot be applied to iron, has led to the adoption of a similar course of action in the casting of bronze figures and groups in one piece, thus eventually simplifying and cheapening the process. It is, therefore, perfectly in accordance with common sense and experience to assume that many important works in bronze of a complicated character produced on this occasion owe much of their success to the manipulative skill and experience gained by the moulder in the successful efforts to produce fine works in the inferior, or at least cheaper, metal, iron, from the fact that if produced at all they must be cast in one piece.

This law of action and re-action in various phases of industry is one which is singularly illustrated in several sections of this Exhibition.

FINE ART BRONZES.

Fine art
bronzes.
Victor
Thiebaut's
castings.

Taking the first-named class of bronzes into consideration, the principal works are represented by Victor Thiebaut, 144, Rue du Faubourg St. Denis, Paris (class 22, No. 26), and also in the central garden, as objects of fine art, by the artists who designed and modelled them. As works of fine art in bronze, Thiebaut's castings stand very high, and deserve careful examination. The most remarkable are a series of statues, life size, designed and modelled by several able sculptors, most of these being cast by Thiebaut. One is by De la Planche (686, Fine Arts), a boy standing on the back of a tortoise with a bullrush poised above his head, as if using it as a whip. The spirit, expression, and composition of this work are admirably adapted to the material in which it is produced. Another is entitled "The Winner of a Cock Fight" (74, Fine Arts), a boy running with a pet cock held caressingly on one arm, modelled by A. Falguiere. "The Young Equilibrist," as it is aptly named, is also an excellent work of the same class. It represents a boy spinning and balancing a plate on the point of a stick. This is designed and modelled by Blanchard (628, Fine Arts). A boy with a tambourine "The Saltarelle Dancer," by Sanson (825, Fine Arts), is another work of the same character;

whilst the bronze of St. John the Baptist, represented as a boy, preaching, designed and modelled by P. Dubois (700, Fine Arts), differs from the works above quoted by its sternness, severity, and ruggedness of character, not so much of treatment as expression.

MR. WALLIS
ON
BRONZES,
&C.
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All these works are excellent illustrations of artistic modelling and design, as adapted to this special material and mode of production. There is no trick in first making them apparently, if not really, difficult to mould and cast, and then overcoming these difficulties by methods skilfully provided for in the course of the modelling; thus frequently producing a constrained result in the arrangement of the group or pose of the figure. Everything has been kept simple in treatment, and there is a natural look about each figure which takes it out of the class of commonplace works in bronze or marble. No effort has been made to avoid "firing on" separate parts essential to the completion of the design: and when this is done it is with such consummate skill as to render it scarcely visible even to the trained eye accustomed to look at the right point for the usual evidence. This is especially the case with the advanced leg of "The Young Equilibrist." The chasing and finishing of the surfaces at these points present examples of true art-skill—the power to conceal the method of the work rather than to display it. The manipulation is never overdone; the touch of the original artist has been artistically, not mechanically, preserved throughout.

Character of
the model-
ling, casting,
and chasing.

Another subject of the series is "A 'Find' at Pompeii" (794, Fine Arts), designed and modelled by H. Moulin, but cast by Jacquire. It represents a boy, with a spade over his shoulder, holding up with one hand a mutilated antique bronze of a dancing Silenus. The face of the boy expresses the high glee with which he examines his prize; and, in the ecstasy of his delight, he imitates the action of the antique figure in the dance. This is a work of great spirit, admirably adapted to the treatment it receives by the founder and chaser. The locality of the "find" is suggested by the scattered fragments of tesserae which appear on the base.

Jacquire's
casting.

A flute-player, by Delorme, is another example of Thiebaut's skill as a bronzefounder. This is a boy, seated, studying the fingering of a flute.

Delorme's
flute player.

"The Infancy of Bacchus" is also a fine example of casting, chasing, and general finish, as applicable to this class of art-works. This is from a marble group in the French Fine-Art Gallery (808) by J. J. Perraud.

Perraud's
Infancy of
Bacchus.

A life-size statue in bronze, silvered, of the Prince Imperial caressing a favourite dog, after the original marble, by J. B.

Carpeaux's
Prince
Imperial.

MR. WALLIS
ON
BRONZES,
&c.
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Reproductions after
Jean Goujon

Carpeaux, is a good example of treatment in metal, moulded from a finished work in marble (648, Fine Arts); and it may be well to observe here, that in several instances in this Exhibition in which marble busts have been copied in metal, in most cases electrotyped, the result has been much more satisfactory when they have been silvered and slightly oxydised, than when finished in the bronze tint. In fact, the subdued silver tint renders the light and shadow, as also the forms of the original marble, much more truly than unsilvered bronze can do.

M. Thiebaut has reproduced in bronze the famous bas-reliefs by Jean Goujon, from the "Fontaine des Innocens." The casting and finish are alike worthy of examination.

In the smaller works which he exhibits the most important are reductions of the subjects quoted. There are the same skill and artistic discrimination in the treatment and finish. In short, these works never descend into the style of finish and colour which characterises the merely decorative works of this class.

Only a few other bronzes exhibited in the French Fine-Art Gallery in addition to those already quoted as specimens of the bronzists' skill demand special attention. The most important is J. Valette's clever statue, "The Sower of Tares" (833, Fine Arts). This is an admirably-balanced work. The swift and stealthy action of the Sower of Evil is admirably given. As a bronze it is of a high class in casting and artistic finish.

Two works
by Vidal,
the blind
sculpter.

Two works by Vidal (called Louis Navatel) deserve special notice, from the fact that the artist has been blind for fifteen years, and yet has pursued his profession. With what success, the "Bull" (837) and the "Dying Stag" (838, Fine Arts) give interesting evidence. As bronzes they are bold and vigorous in treatment. The "Dying Stag" is remarkable for its expression and the thoroughly intelligent anatomical treatment of the subject. In point of texture, these bronzes are the most unaffected, and therefore the truest bronzes of animals in the Exhibition, except some of the smaller works exhibited in the Russian section.

A fine bronze life-size figure of "Hebe" seated upon the eagle, designed and modelled by Franciski, ought to have been placed in the gallery of the Fine Arts, but being exhibited by the founder J. Voruz, senior, of Nantes, it is placed in Class 22 (85). This is a very excellent piece of casting and chasing, and is a special example of what French founders can do in works of this class, as it is moulded and cast in one piece.

DECORATIVE BRONZES.

MR. WALLIS
ON
BRONZES,
&c.

Decorative
bronzes.

The very remarkable and extensive collection of decorative bronzes and works in metal which may be comprehended in the second of the classes into which it has been thought advisable to divide the French bronzes for the purposes of this report, will now claim consideration.

As a matter of course, there is an incessant repetition of the same general characteristics. Novelties are attempted by one manufacturer, and repeated in varied forms by others. Thus it frequently happens that a decorative effect, which in itself is tasteful and successful, runs into positive extravagance and mere conceit by changes introduced as variations, which are not improvements.

There are two features in this class of metal-work which give a distinctive character to the collective exhibits, different from that of similar collections in previous exhibitions. One is the extent to which *cloisonné* enamelling has been introduced as a polychromatic and decorative adjunct, and the other is the use of variegated marble, chiefly the onyx marble or alabaster of Algeria, in connection with metal.

Bronze
and onyx
marble.

The most remarkable enamelled works, both in size, elaboration of design, harmony of effect, perfection of execution and finish, are to be found in the collection exhibited by F. Barbedienne (42). In these objects a new development of decorative art in Europe is illustrated. Based on Oriental taste and modes of production they rival the enamels of the East alike in design as in execution. In the best example, the vitreous colour is rich in tint, solid in the body, and becomes perfectly homogeneous with the metal base, so far as the two substances can combine in the formation of one surface. It would be quite useless to quote special objects here, inasmuch as to appreciate the real position of this phase of decorative art the whole should be carefully examined.

Enamelled
works.

Barbe-
dienne's
exhibit.

The bronzes, statues, statuettes, busts, &c. exhibited by Barbedienne are of the very highest class as decorative works. The more severe style, however, is avoided. Some of the finest works are in tinted bronze, and probably the best example of this class is a bust of Bianco Capello, a pendant to the Gorgone of the Duchess Castiglione-Colonna, purchased from the Royal Academy Exhibition 1866, for the South Kensington Museum. In its style the treatment of the metal-work is most successful. In the flesh it is large and grand; whilst the decorative character of the costume, which is arranged and rendered with great skill, gives ample scope for the variation of tint in silver, gold, and black

Tinted
bronzes.

MR. WALLIS
ON
BRONZES,
&C.

bronze. Nor does the work lose so much in dignity as might be expected from these variations of surface tint; owing, no doubt, to the thoroughly artistic character of the modelling, which no after treatment in the way of colour could well destroy.

Small
bronze
busts.

M. Barbedienne has some specimens of casting in bronze, chiefly small busts, in which the amount of metal is reduced to a minimum by skilful casting. In these examples the "core" has been so carefully graduated from the full size of the model, and the fitting to the centre by the moulder so skilfully managed, that the metal is not very much thicker than stout paper or ordinary cardboard.

Ornamental
bronze
castings.

Amongst the ornamental bronze castings is a balustrade or railing placed in front of the space occupied by the objects displayed. This is designed and executed with great skill. The distribution of the parts is very perfect, and the quantities well balanced. The foliage is treated in full relief, and with a success not always attainable in such details.

Lobby
lamps of
special con-
struction.

Another useful and ornamental object is a hall or lobby lamp. It is one of the most successful arrangements of mere lines in the Exhibition, and is a proof how much may be done with simple materials when these are thoughtfully and skilfully used, and the materials themselves understood and duly considered. The centre of this lamp is formed of a cone of opal glass, which acts at once as a shade and a reflector to the light of the lamp placed below. This lamp is suspended by an arrangement of the framework descending through the cone, and uniting with the body of the lamp at the handles; this body being of an amphora shape, decorated with ormoulu and silver. The central ring surrounding the under edge of the cone is decorated at points by anthemions, from which start small branches bearing plain glass sconces for wax candles. This ring is suspended from a corona, which surmounts the whole, by means of long taper links of silvered bronze, alternating with small links formed of a bulb of metal and two circles or rings in ormoulu. A sphere of metal in silver and ormoulu bronze is suspended by chains above the lamp chimney; a small bell-shaped figure being next to the orifice of the chimney itself. The effect of the whole is elegant and very suggestive.

Silvered
mirror
frame.

A mirror frame in the style of the Renaissance is another highly decorative object deserving of close examination. It is in silver and ormoulu bronze, with panels of enamel, in imitation of Limoges, inserted at suitable points in the composition. As an example of skilful modelling and chasing, and the use of a variety of materials in successful combina-

tion for the production of a given result, this mirror frame is especially noteworthy.

MR. WALLIS
ON
BRONZES,
&c.

Another remarkable decorative display, although not so extensive or so varied as that of Barbedienne, is the exhibit of L. L. Marchand (40). A mantelpiece of black marble, inlaid with coloured details and gold ornaments in the mouldings, forms the central object. Two bas-reliefs of figures in green bronze support the sides. The black marble details are decorated with mouldings, in green bronze, console brackets, anthemions, and a central chimera in the tympanum of the pediment. The bases and capitals of the columns in the upper portion of the work are in the same material, whilst a figure in gilt bronze surmounts the acroterium. The details of this work are admirably wrought, and the effect of the whole is highly artistic; but it would have a sombre appearance unless placed in a very well-lighted room. The effect is a subdued one seen, as it is in the Exhibition, by a roof light.

L. L. Marchand's
black
marble
mantel-
piece.

A fountain or lavabo, in the style of the Renaissance, is another work of great merit exhibited by M. Marchand. It is in bronze, silvered and oxydized, with enamels in white and blue. The design is very spirited, and the chimera-like lions, as supporters of two shields on each side of the basin, are modelled with great skill, although somewhat extravagant in their style of treatment. This work has a background formed of a plaque of ebony, with a well-arranged ornamental outline. It successfully throws up the forms of the object, and contrasts effectively with the oxydized silver.

Fountain
or lavabo.

An imposing display of decorative bronzes of a high class, but of familiar subjects, is made by G. Denière, junior (58). They are chiefly of the dark, antique bronze tint; and the contrast between these bronzes and the works in ormoulu with which they are surrounded—the whole being harmonized by a background of ancient tapestry—produces a very artistic effect. A chimney-piece in white and red marble, with an oval mirror over the centre, and two seated supporters holding candelabra, with other decorative metallic details in bronze ormoulu, is a very striking and decorative object. The work, however, is thoroughly French in style and treatment.

G. Denière,
junr., dark
coloured
bronzes.

It may be remarked as worthy of attention by those whose business it may be to arrange works in bronze as the decorative adjuncts of the drawing-room or dining-room, that the French carefully consider the colour of the bronzes which are to form part of any given arrangement as a necessary element in the success of the *ensemble* to be produced. This may appear so obvious as not to be worth mentioning

Decorative
arrangement
of bronzes
with tapes-
try.

MR. WALLIS
ON
BRONZES,
&c.

Victor
Paillard,
bronze
amorini.

here; but however distinctly the fact may be seen and acknowledged, it is for the most part practically neglected in England.

A certain specialty of treatment has always characterised the amorini of the French bronzists. The works exhibited by Victor Paillard (41) illustrate this in a most pleasing and satisfactory manner. There is a certain degree of conventionality about these works, no doubt; in fact, they are furniture bronzes of a very high class, and as such they are decorative rather than sculpturesque. It is not often, however, that the character of infancy is so thoroughly well treated. There is a full appreciation of the innocence of childhood in its happiest moods which is rarely to be found in far more ambitious works. As studies of treatment in metal, especially in this direction, M. Paillard's bronzes are excellent, for there are few things done so often by modellers for metal-work as amorini, and certainly there are few things in which so small an amount of real success is achieved.

G. E. H.
Servant.
Candelabra
and lamps.

The candelabra and lamps exhibited by G. E. H. Servant (28) are distinguished by an originality of style which renders them very attractive after the dull round of repetition in these objects which is observable in various other exhibits. One lamp with a tripod stand, the lamp proper being placed above a vase in black marble, is an admirable example of decorative construction. The vase is decorated with green bronze mounts, ormolu details being introduced with great taste and discrimination.

Schlossma-
cher & Co.,
candelabra.

Schlossmacher & Co. (887) exhibit lamps of a very ornate character. Two candelabra are specially noticeable. One in silver and ormolu bronze is good in design, the arrangement being simple and to the purpose. The masses of form are well distributed, giving value to the central stem, the line of which is broken to the eye by well-arranged pendant chains. Another in bronze is an affectation of Assyrian design, based on the Nimroud marbles. The details are varied, and cleverly managed; but, after all, the adaptation is not successful.

Lerolle,
cast brass
in the
manner of
repoussé.

In addition to a very artistic display of decorative bronzes of high character, especially in workmanship, L. Lerolle (44) exhibits excellent illustrations of the treatment of cast brass, finishing the surface as wrought work or repoussé. A centre panel and a specimen of the repeating panels of a balcony are very successful. The design and treatment are the same as in hammered work, whilst the effect is excellent. The centre panel consists of two lions supporting a cipher, and is in the style of Louis XIV. The repeating panel, which

illustrates the general features of the balcony railing, is composed of compartments bounded by fillets of plain burnished metal, with rosettes and laurel pendants as decorative details.

MR. WALLIS
ON
BRONZES,
&C.

Amongst M. Lerolle's bronzes, a tripod table with flower-vase, of Etruscan design, and a jardinière, in the same style, are notable specimens of artistic bronzework. The large plateau of the table is decorated in *intaglio*, with an admirably designed ornament. The vase is treated in the same manner; but all these details are cast in the metal, and, although very minute in treatment, do not appear to have been touched with graver or chasing tool, except at special points in which it has been requisite to clear them from the mould marks.

Bronze
tripod table
and flower
vase.

J. Delesalle (45) exhibits an excellent collection of the smaller objects of art usually executed in bronze. Most of these are treated with great skill and artistic judgment; and, although none can be selected for special examination, the collection is too important an one to be neglected by persons interested in this specialty, which forms so extensive a section of the bronze manufacture of Paris.

J. Delesalle.

C. S. Matifat (84), to whose taste and discrimination in the production of designs and patterns for casting many English firms have been largely indebted in past years, has some very excellent examples of bronze casting, finished and unfinished. The former show great skill in moulding, the latter judicious taste and finish.

C. S. Matifat.
Bronzes and
chandeliers.

Two chandeliers are very original in treatment and design. They are of the same class of work as the balcony panels mentioned above in noticing M. Lerolle's exhibits—that, is of cast-brass, treated as wrought work. One of these chandeliers has all the effects of repoussé, and the design is very original, but rather heavy. In short, the weight of metal is too evident within the space in which it is arranged as ornamental detail. The other chandelier is equally original, but much lighter, the metal being arranged so as to form framed work for the support of decorative adjuncts in glass—plain, cut, and coloured—introduced at different points in the composition. The metallic masses in the centre are decorated with ornaments in *intaglio*. The effect of the whole is Oriental, without being an imitation of any Eastern style, although it approaches the moresque in the character of the details.

One of the simplest and most useful objects exhibited by M. Matifat is a pair of double lights for a table, in wrought brass. They are at once simple, elegant, and useful. The forms and arrangement are to the purpose, without any affectation or over-decoration, and yet they are decidedly ornamental.

MR. WALLIS
ON
BRONZES,
&c.

J. Fel.
Illustration
of moulding
and casting
bronze
groups.

Models of
animals.

Horses and
racing
subjects.

F. H. Pey-
rol's
racing
subjects.

Bronzes of
birds, &c.

Auguste
Cain.

One of the most useful and suggestive exhibits in class 22 is that of J. Fel (86). It illustrates in a very effective manner the method of moulding and casting bronze groups of a complicated character in *one* "jet." The subject of the Laocoon, the three figures being cast in one mass of metal, is in itself an illustration worthy of careful examination and study. The others simply illustrate special points in the arrangements of the moulds and cores, but repay a prolonged inspection technically, although they have nothing specially inviting about their appearance, as all the "jets" are left upon them as they came from the sand of the casting pit.

The production of animals, groups of animals, dead game, and kindred subjects by the Parisian bronzists, is so large that, as a matter of course, there is a considerable display of this special section of the bronze manufactures.

It has been the fashion of late years amongst the upper and wealthy classes in France to patronise horse-racing and sporting generally, so far as the national habits of the French will permit. This in addition to the necessity for meeting foreign demand, has given rise to a new phase in this animal section of the bronze trade, and racehorses with mounted jockeys, &c. have replaced the military equestrian statuettes of twelve or fifteen years ago. It must be confessed that statuettes of racehorses are very tame and spiritless affairs when compared with the war horses of the past time. Attempts are evidently made to get portraits of special favourites, such as "Gladiateur," and the result is generally a failure artistically, since in aiming at individuality with such subjects in such a material, all freedom of execution is lost, and the work becomes merely a mechanical reproduction of a not very clearly understood natural subject, in which both the picturesque and sculptural qualities are at a minimum.

The bronzes exhibited by F. H. Peyrol (46) will illustrate these points. As bronze castings they are good, and over-finish has been avoided in the metal. Thus the artist's model has had fair play; but the racing subjects are pre-eminently French in treatment.

The exhibits of Auguste Cain (48), P. J. Menez (49), G. F. Dietsch (51), and F. J. Cana (52), are all illustrations of the great skill which French modellers for bronze work have attained in the execution of birds, and a certain facile treatment of the plumage which, if occasionally conventional, is very artistic in its effects.

M. Cain's subjects have resulted in some most ingenious castings, and he is undoubtedly the boldest and most original designer and modeller of the feathered tribes. His grandest

work is a vulture seated on the half mutilated head of an Egyptian Sphinx. It is rather grand in conception and large in treatment. The casting is good, and the finish admirably adapted to the subject.

MR. WALLIS
ON
BRONZES,
&c.

The birds in bronze exhibited by M. Dietsch are especially noticeable for the admirable treatment of the plumage. The other animal subjects are marked by great intelligence in the modelling and texture. Most of these works are designed and modelled by Moigniez.

Dietsch.

Models by
Moigniez.

M. Menez's groups are very clever and spirited, but are injured by an over-lacquered effect, which destroys the surface. Great skill and ingenuity has been exercised in the casting of some of these works, and they repay examination on this point alone.

Menez.

M. Cana's contribution is comparatively a small one, but it is very effective in detail. It consists chiefly of birds, and he seems to delight in the softer effects of the plumage. The texture of these bronzes is very excellent, and they are finished with an artist's appreciation of nature. The metallic character, however, is never lost.

Cana.
Birds, &c.

The finish M. Cana has brought to bear upon a tripod plateau is remarkable. The centre of the work is occupied by birds and rabbits. The birds are sporting in standing corn, and the rabbits amongst fallen timber and underwood. The central medallion represents two dogs, but these are not very successfully treated. The outer rim or border is divided into three principal compartments, representing as many chief objects of the chase—the stag, the boar, and the fox—all treated with considerable art skill. A sub-panel between each represents the emblems of stag, boar, and fox hunting. This work, though small, is a notable one in bronze.

Tripod
plateau.

A collection of flowers in bronze and bronze silvered and oxydised, exhibited by Delfau (55), is another illustration of the successful study of natural objects by the bronzist. These flowers are attached to slabs of marble and wood panels. They are modelled by Delfau and chased by Dalibard, and are deserving of special examination by all art-workers in metal, as they are the most perfect things in their way in the Exhibition. In spite of a very close adherence to nature, the metallic character has been kept up in the treatment, so that they are quite removed from the ultra-imitation of the ordinary models of flowers for metal-work.

Delfau.
Groups of
flowers in
bronze.

In connection with the admirable execution of these flowers, and their treatment with silver oxydised, it is desirable that a similar method of treating some of the smaller decorative objects in bronze should be noticed. In a very artistic

Gautier and
Albinet,
clocks in
bronze
silvered.

MR. WALLIS
ON
BRONZES,
&c.
—

exhibit by Gautier and Albinet (54), in addition to some admirable bronzes, there are several clocks and other objects in bronze, designed, modelled, cast, and chased with such skill that, being finished with silver by the electro-deposit process, they have all the appearance of works in silver, from the style adopted in their execution. In this respect they are practically imitations, but this does not in any way lessen their claim to attention as specimens of art-workmanship. There are other exhibitors of similar works, but those quoted may be considered as the best representatives of their class. The bronze mirror-frame, already noticed, as exhibited by Barbedienne, is simply a very special example of the same method of production.

Ormoulu
bronze.

From this silvered bronze the transition is easy to the very brilliant display of bronze ormoulu which meets the eye at every turn in the courts devoted to the exhibition of the specialties under consideration. The extent to which this art-industry has been carried in France, and the excellence of the gilding in brass and bronze by the use of mercury, have become traditional. The electro-deposit process of gilding, even when done with an extra quantity of the precious metal, produces a dull effect in comparison with the rich brilliancy of tint which results from the mercurial system. Unfortunately this process is a very unhealthy one for the workmen, and no one can be surprised that the Imperial Commission sanctioned the award by the juries for group 10 of a "Grand Prix" to M. Henri Dufresne for his invention, as exhibited in Class 94 (47), by which it is stated gilding by mercury can be executed without danger to the health of those employed in the process.

H. Dufres-
ne's new
method
of gilding
without
mercury.

Personally, I cannot say that the examples shown by M. Dufresne appeared to me at all equal to the usual works in ormoulu; but from his reputation as a damascene worker and metallurgist of great scientific and practical skill, there can be no doubt he satisfied the jury of the excellence of his system; and it is to be hoped that it will be adopted in England as readily as certain English processes have been adopted in France, and with equal success.

Objects in
ormoulu.

Objects in ormoulu form a portion of the display of most of the bronzists, whilst in many instances the exhibits consist entirely of works finished in this manner; but it must be confessed that the finest examples are those which have been executed by the more skilful bronzists as special proofs of their skill in this direction.

Auguste
Lemaire.

Amongst the very excellent decorative bronzes of Auguste Lemaire (56) will be found some of the finest examples of ormoulu. The "mat" of these works is especially noticeable

for its richness of tint; whilst the judicious introduction of "burnish" gives greater value to it, since the latter does not, as is often the case in less artistic specimens, overpower the former.

MR. WALLIS
ON
BRONZES,
&c.

M. Lemaire exhibits a pair of bronze statuettes of nymphs, designed and modelled by Carrier; also a bacchante crowning a bust of Pan. These works are executed in the artist's best manner, which is always artistically decorative, and, although approaching the conventional, is essentially original. The system of chasing adopted in the flesh portions of these works is very novel and effective, and deserves examination and study. It may, perhaps, be considered too near an attempt to imitate the pores of the skin; and when looked at very closely, this objection holds good; but seen at a proper distance, it imparts a charmingly soft surface to the bronze, making the flesh portions contrast well with the drapery; and yet the metallic character of the material is in no way interfered with. It may be "trick," but it is so skilfully and artistically done that one is not disposed to find fault with it, although in the hands of an unskilled chaser the effect would become vulgar and commonplace.

Bronze statuettes by Carrier.

Novel style of chasing.

Two objects exhibited by M. Lemaire, in which ormoulu has been skilfully and effectively introduced, have been selected for engraving.

One is a vase for holding a plant. It is supported by a tripod stand in green bronze and ormoulu. The design, *à la Grec*, is admirable, and the details are well subordinated to the proportions. The vase itself is amphora-like in its character, and is sustained by a smaller tripod composed of three terminal figures running downwards into an ornamental arrangement, which is completed by goats' feet resting upon a triangular base of black onyx marble.

Vases in bronze and onyx marble.

The other object is a candelabrum in silvered and ormoulu bronze. The base is of the same design as the stand in the last named; but the treatment is so different as to show in a very interesting manner how skill and taste can utilise a good design for a variety of purposes and yet never violate the original intention. From this base the stem rises which supports the lamp vase, the vertical line being broken by a tasteful arrangement of chains. The vase is of good form except the neck and lip, which have been sacrificed to adapt it to use as a moderator lamp. The whole work forms an elegant object of art manufacture, and is very suggestive.

Candelabrum in silvered and ormoulu bronze.

A candelabrum exhibited by Martinet Brothers (87), whose display of objects in metal for illuminating purposes is a very good one, is especially noticeable for its elegance and

Martinet Brothers.

MR. WALLIS
ON
BRONZES,
&C.

Bronze
platinum
with or-
moulu.

the originality of its design and details. It is of bronze platinum with ormoulu details introduced in a very effective manner. The process of covering the bronze with platinum is similar to that used in the gilding with mercury for ormoulu, although it can also be deposited by the electro-galvanic process. The design of this candelabrum is essentially metallic in its character, and suggests hammered work of a refined and costly character. It has a tripod base, the shaft or stem is also divided into three branches, and is of a design which suggests "twisted" work broken by a scroll ornament. This shaft supports the tazza-like base of the lamp. The body of the latter is a decorated sphere, and thus harmonizes well with the other forms.

O. Renauld.
Candelabra.

Forming a portion of a small but pretty exhibit by C. Renauld (33) is a pair of candelabra in bronze, silver, and ormoulu. The plan is that of a tripod rising from a ring. The feet support the central shaft, and the scrolls combine with the tripod arrangement to support a tazza-like detail or plateau, on which is placed the vase which forms the body of the lamp. In point of design these candelabra are of more than ordinary excellence, and the intention of the designer has been well carried out by the manufacturer. There is no affectation of high finish, but the work is good and to the purpose.

Raingo
Brothers.
H. A. Houd-
bine.

Green
bronze.

The only other exhibits of works in bronze to which special attention need be called are those of Raingo Brothers (62) and C. H. A. Houdbine (79). The first named is a varied and highly decorative display, but with very little of a pure art style to redeem it; and the latter may be suggested, as illustrating the combination of green bronze, ormoulu, and black onyx marble, in a variety of decorative objects of excellent design and workmanship.

Jules
Graux,
MM. Bou-
lonnais.

Cast brass
in imitation
of wrought
work.

As final illustrations of the new feature in the finish of cast-brass work in the wrought manner, already alluded to, a candelabrum exhibited by Jules Graux (59), and a clock and lights by MM. Boulonnais (63), may be quoted as worth examination. The candelabrum is for 12 lights, in two tiers, and is in burnished brass, of peculiar excellence in colour. It is one of the best designed and most original works in the Exhibition. The ornamental details are novel in character, and elaborate in their several parts. The drawing and arrangement of the lines of construction deserve attention and study. Unfortunately no illustration would give a proper idea of these qualities, and the technical skill shown in the production of the work can only be appreciated after careful examination. The clock by Boulonnais is evidently

an experiment on public taste ; the casting and finish of the brass work, which is also enamelled, are evidence of great skill in this direction.

MR. WALLIS
ON
BRONZES,
&c.

Amongst the exhibits of fenders and fire-dogs there are some very suggestive objects. As a matter of course these adjuncts of the fire-place differ very much from the same class of works made and used in England ; but their examination cannot fail to be useful to the designer and manufacturer. The two principal displays are by N. I. Morizot (95) and J. G. E. Clavier (96).

N. I. Morizot.

Morizot has two fenders in bronze ormoulu, which are excellent examples of design as applied to such objects. The casting and chasing are admirable, and the colour of the gold has a remarkably rich appearance ; the contrasts of " mat " and " burnish " being cleverly managed. Of the quality of this ormoulu evidence is given by the exhibition of a pair of fire-dogs, the gilding of which was executed 14 years ago. They are in excellent condition now.

Fenders in
bronze or
ormoulu.

M. Morizot's fire-dogs are all good in design. One pair in burnished brass is very excellent. Others are finished in ormoulu and platinum, or in platinum only, as also in silver oxydised. One pair may be specially quoted as being at once simple in general form, admirably adapted to use, and very decorative without being too ornate in the details.

M. Clavier exhibits several admirable fire-dogs in iron, and iron with ormoulu. The works in ormoulu only are *rococo* in style. One pair in uncoloured bronze, surmounted with figures of Mars and Minerva, are well designed and modelled, the casting and chasing being also good. Bronze fire-dogs are preferable for use in the uncoloured state. The best designed, and also the most carefully executed of these special works, is a pair in wrought iron, with cast-iron and bronze ornaments. The varied effects of the three modes of decoration, or rather the use of one in ornamental construction and the other two in the details, is excellent, as the parts are thoroughly well arranged, and the objects well adapted for use.

J. G. E. Clavier.

Fire-dogs in
iron.

Another pair in bronze, silvered and oxydised, is in the byzantine style of ornament. The general form is good, but a little thin. The base is formed of a sphinx-like chimera, the twisted tail and wings forming the perforated portions of the lower part. The shaft is decorated with a diaper and a Byzantine capital, from which hangs a highly-decorated ring handle. The capital supports a finial of good design, formed of a sphere resting on a foliated neck.

Fire-dogs in
bronze, sil-
vered and
oxydised.

It may be useful to state here that there are some admirable illustrations of bronze casting exhibited in Class 40

Victor
Thiebaut.

MR. WALLIS
ON
BRONZES,
&C.
—
Bisquin &
Laine.

(102), by Victor Thiebaut, in addition to those already noticed in Class 22; and that Bisquin and Laine, exhibit, in the same class (104), some bronzes in a highly instructive form, as the castings are all shown with the "jet" courses upon them; only those being removed which interfered with the proper examination of the work.

ZINC-BRONZE AND ZINC.

Zinc-bronze
and zinc.

The production of decorative objects in zinc has taken a very decided position in France during the last eight or ten years. At first it seemed destined to be confined to architectural details of various kinds, and to objects suitable to the flower garden and hothouse. The application of the electro-galvanic process, by which the surface could be covered by a deposition of metal and made to imitate bronze, and by which also it could be silvered and gilt, not to mention the more factitious methods of colouring the zinc surface to imitate bronze without incurring the cost of any metallic deposit, has led to the development of a very extensive manufacture in Paris. Practically, this industry has arisen since the last International Exhibition in Paris, in 1855, on which occasion there were but comparatively few specimens of zinc, electro-coppered and bronzed, displayed.

Rise of the
zinc-bronze
industry.

Imitation
character of
the works.

In the present Exhibition the aggregate display is a very extensive one, but it is simply a reflex of the style and art-power shown in the production of bronzes, occasionally running into decorative excesses in the way of gilding, variegated tintings, imitations of coloured enamel, &c. The works are chiefly reproductions of bronzes, cheapness being the main object. Little originality is attempted, and when such is the case it mostly runs into an extravagance which would not be tolerated in the true bronze. Occasionally the treatment is heavy, and more like that of carved work in stone or marble, rather than of works modelled to be cast in metal.

It would be easy to dismiss these zinc-bronze works as "shams," and so far not worth further notice; but, as they are honestly shown as imitations, and present features in which considerable art-skill is combined with much ingenuity in manufacture, they are so far worthy of examination as specimens of a distinct industry.

Before proceeding with the brief details which space permits for the consideration of these castings in zinc, it is desirable to state two facts, as illustrating their economical production and durability.

Economy of
production
as compared
to bronze.

In the less complicated works a plaster of Paris mould will yield three or four, and sometimes more, castings in zinc,

thus giving a great economical advantage over the casting of a bronze of the same character. As regards the comparative durability of works in zinc properly covered with a deposit of bronze or copper, it must be borne in mind that the zinc has such an affinity for the deposited metal as to practically unite itself with it more firmly and tenaciously than would be generally supposed. This is the best possible guarantee for the enduring character of the surface, which becomes, as far as possible homogeneous with the metallic base constituting the cast.

MR. WALLIS
ON
BRONZES,
&c.

The most notable display is that of Miroy Brothers and Son (22). This consists mostly of large castings of life-size statues, equal in modelling, chasing, and finish of surface to the best bronzes. Showy tinted effects, with the introduction of enamel and colour in imitation of enamel, predominate. Some of the figures represented in armour are very spirited, and deserve special attention.

Miroy
Brothers.

J. Bery's (24) is the next most extensive exhibit. The large candelabra are all excellent examples of casting, chasing, &c., and a sufficient proof of the art-skill which is now devoted to the production of this class of work in zinc. A novel and, in its way, satisfactory effect has been obtained in one pair of candelabra, composed of lifesize Chinese figures, male and female. Each carries a framework of Chinese construction upon the shoulders, and from this frame the lamp is supported above the head. It is a species of caryatide, with the shoulders as the supporters of the object carried rather than the head. The details of the decorations on the dresses are wrought out with great skill. The base is purely Oriental in design, and the character is well kept up by the pendant bells and spheres in burnished ormoulu, suspended by gilt cords.

J. Bery

Candelabra
in zinc
bronze.

P. Chassagne (23) exhibits some very cleverly designed and modelled statuettes. One pair, about 4 ft. high, of Otho of Hungary and Rupert of Bavaria are very spirited.

P. Chassagne.

The best display of small objects in zinc-bronze is that of Blot and Drouard (1). The variety is very great, and generally the art-skill and workmanship is above the average.

Blot &
Drouard.

As an illustration of the extent to which extravagance in colouring, enamelled effects, gilding, silvering, and the admixture with other materials is carried in zinc-bronze objects, the exhibit of L. Hottot (18) may be quoted. Here even flesh tints have been introduced, and imitation enamels in green, red, blue, and black predominate over the bronzed surface of the zinc; and these things are made still more garish by imitation ormoulu and silvered effects—a warning to all who

L. Hottot.

Extrava-
gance of
enamel
imitations.
&c.

MR. WALLIS
ON
BRONZES,
&c.

Prices of
works in
zinc bronze.

Grados,
uncoloured
and un-gal-
vanized
works in
zinc.

desire to see true art-manufacture make that genuine progress which comes of art-skill directed by science and common-sense.

As might be expected, the prices of these imitations vary considerably from those of similar objects in bronze. There is, however, no fixed proportion, as the prices vary from one third to two thirds less, and the average may be taken at about one half.

There are a few exhibits, chiefly in class 40, of works in zinc, uncoloured, and ungalvanized. The most remarkable example is that contributed by Grados (134). It consists of an architectural structure suitable for a gateway to a park or garden, and forms the entrance to the French galleries for the class in which it is placed. The columns and archivolt of the central opening and the architecture of the two sides are all of a decorative but decidedly architectural character. It is severe in its adherence to architectural precedents, and the workmanship is excellent; but, as the forms are those usually seen in stone, the lithic character of the treatment contradicts the metallic material in which the work is produced, and it is rather a lesson what to avoid than one suggestive of imitation.

ALUMINIUM BRONZE.

Aluminium
bronze.
Paul Merin
& Co.

Objects manufactured in this new compound metal are not so numerous as might have been reasonably expected, looking at the position the discovery had attained in 1862. MM. Paul Merin & Co. (class 40, 276) exhibit a variety of objects useful for the table, watches, and bijouterie (chiefly, however, the first named); spoons, knives, forks, &c. being the principal articles. The golden tint of this metal has a pleasing effect, and the high polish it takes shows its compactness and hardness. It is doubtful, however, if it will come very readily into use for the service of the table, as silver will always be preferred, from the association of bronze of any kind with brass, although this bronze aluminium is unaffected either by ordinary acids or the atmosphere.

HAMMERED AND CHISELLED IRONWORK.

Hammered
and chisel-
led iron
work.

G. Masson.
Candelabra.

There are a few admirable examples of wrought and repoussé ironwork exhibited, in connection with bronzes. Of these the most remarkable in size is a pair of candelabra, by G. Masson (91). They are about 7 ft. in height. The design is simple in detail, but results in a combination which produces a most effective work. The base is a square, the foot scrolls rising at right angles and running

into the central shaft, which is decorated at corresponding angles; and these decorations run into an inner double scroll work, which supports a coronal of iron in repoussé work. From this coronal the branches which bear the lights spring. These again are supported by scrolls in three tiers, the whole being finished by a coronal of a different design, also in repoussé. The scrolls for the lights are decorated by pendants of simple but effective construction and design, hinged upon the lowest sweep of each scroll, and thus breaking the line and preventing its looking bare.

MR. WALLIS
ON
BRONZES,
&c.
—

Ch. Marchand also exhibits, in connection with the bronzes, &c. already noticed (40), a lofty pair of wrought-iron candelabra designed in the Etruscan manner. They are executed with great skill, and repay careful examination as a sound lesson in iron working.

Ch. March-
and.
Wrought
iron candel-
abrum.

A pair of door-knockers, suitable for a large *porte cochère*, executed and exhibited by B. Faget, of Bordeaux (34), are very remarkable specimens of artistic ironwork; one of them is especially noticeable. The attachment-plate is a plane in the great portion of the surface—of perforated design, and relieved by foliage in repoussé. The details of the framework of the striking part, or hammer, of the knocker are admirably chiselled in relief, some portions being burnished, and others left in “mat.” The sides are covered with foliage in repoussé riveted upon the solid mass of the hammer. The hinge is constructed in an artistic and skilful manner, and forms an essential portion of the design. The other knocker is smaller, and, although equally excellent in point of execution, is not so successful in design. M. Faget exhibits some figure subjects in iron repoussé, but, although bold and effective, they lack the refinement of the objects above quoted.

B. Faget
Wrought
iron door
knocker.

In Class 14 and 15, furniture (184), C. Mure exhibits a series of admirably designed and executed mounts for furniture in steel. It consists of details of a varied and elegant character for repetition—studs for the decoration of beadings, also monograms, escutcheons, coronets, and hinges with ornamental details, all of excellent design and workmanship. This is a very suggestive display, and one which opens a wide field of industrial operation amongst a certain class of metal-workers, as the fashion for steel mounts for furniture is evidently reviving.

C. Mure.
Furniture
mounts in
steel.

In Class 94, “articles manufactured by skilled workmen” (97), a pair of moderator lamps constructed of steel, the work of Napoleon Biondetti, deserve special examination. These lamps are of excellent form. The surface of the base and shaft is covered with steel wire (*filigrane d’acier*) carried

Napoleon
Biondetti.
Moderator
lamps in
steel.

MR. WALLIS
ON
BRONZES,
&c.

spirally round the outline. The upper portion of the column, which supports the glass and chimney, is formed of hammered and engraved steel, elegantly and tastefully arranged as regards the details. At these points in the circumference of each lamp there are medallions in ormolu of the Emperor Napoleon III., the Empress Eugénie, and the Prince Imperial, each mounted in an ornamental border of chiselled steel, surmounted by the Imperial eagle, executed in the same material and manner. The effect of the whole is very artistic and will repay close examination, from the very skilful mastery of the executant over his material and the handicraft power shown in the use of the chisel and chasing-tool as applied to steel.

WORKS IN CAST IRON.

Works in
cast iron.
Develop-
ment of
ornamental
iron casting
in France.

Allusion has been already made to the remarkable progress which the numerous contributions in cast iron prove to have been made in France during the past twelve years. This progress creates no surprise in those who have watched the development of the bronze industries, because it was inevitable that the art-skill and power obtained over the various conditions necessary for making good castings in metal, although in the first instance applied to works in bronze and zinc, would, of necessity, be directed to the production of works in iron, when the gradual development of the French iron trade rendered such an application of skill to the cheaper material at all feasible. The result is now before us in the several contributions of leading French ironfounders. The quality of the iron is excellent as regards its surface and perfect finish as a casting material. It is said to be rather brittle, as is usual with charcoal-made iron.

Position in
1844.

Contrasting the very remarkable series of examples now exhibited with the few specimens of ornamental iron casting which were the subject of so much pride and congratulation in 1844, the change is a triumphant answer to those who so rashly declared at that period that whatever France might do in the production of art-bronzes, the casting of such works in iron or anything approaching to them, would always be beyond the power of French artists or artisans to accomplish. Here, however, all is done which was so dogmatically pronounced as impossible, and very much more than even those who calculated what the art-power and manipulative skill and experience gained in the bronze-foundry would be likely to do, could have expected.

A. Durenne.

A. Durenne has two exhibits (25, and Class 40, No. 1). These form a very large and interesting display of castings in iron and illustrate fully the skill to which the founders of

ornamental ironwork, alike in statuary as in decorative details, have attained in France. M. Durenne shows the application of these works to the production of imitations of bronze by the electro-deposit process.

MR. WALLIS
ON
BRONZES,
&C.

Iron cast-
ings in
imitation
of bronze.

Although it is not proposed to discuss the question of ornamental or artistic iron casting at any great length, yet the successful application of the founder's art in this direction renders it desirable that certain salient points should be noticed. The practical ironfounder cannot look upon these specimens of his industry without receiving many invaluable hints from the skilful and thoroughly artistic manner in which these works have been treated by the moulder. The wonderful sharpness and beauty of the smaller specimens, the slight seams left on the surface from the perfectly even and correct fitting of moulds or "cores," the fact that very complicated examples are cast in one piece, and that this has not been done once or twice only and as a *tour de force*, but is the rule rather than the exception, all tend to prove that the skill of the French ironfounder has overcome most, if not the greatest, difficulties in the art of casting in metals, and especially in iron—a material of which twenty years ago he was traditionally supposed to know little or nothing—at least, industrially.

System of
moulding.

The value of M. Durenne's exhibits will be best appreciated by those skilled workmen who may be fortunate enough to get an opportunity to examine them; space will not allow of their detailed consideration here.

In addition to these, however, another series of similar castings is exhibited by Barbezat & Co. (30), from the foundries of the Val d'Osue. All the castings are of high class, and the great skill mentioned as characterising Durenne's works is repeated in these. The most striking success is in the larger works as shown uncovered by bronze. Their execution brings them distinctly within the category of works of art in bronze; and when covered with a metallic deposit they would, for many purposes, be equally effective at certainly one half the cost. A close examination shows, as a matter of course, that certain effects and refinement of surface, always to be looked for in a true bronze, are wanting; but the general result is the same, whilst a ponderous and enduring solidity is ensured by the nature of the material.

Barbezat &
Co.

Iron cast-
ings and
imitations
of bronze.

The qualities here noted are especially shown in the specimens exhibited by J. J. Ducel and Son (57). It would be very difficult to detail, except broadly in the points above named, the difference between the bronzed iron castings as shown by this firm and the same objects in real bronze. The chief objects exhibited by this house are admirable reproduc-

J. J. Ducel
& Son.

Bronze iron
castings.

MR. WALLIS
ON
BRONZES,
&c.

tions of works of the epoch of Louis XIV. These are cleverly executed and artistically finished.

A colossal figure of the Rhine, by Coysevox, the original at Versailles, is not bronzed but finished in the cast iron, and may be quoted as a proof of the skill with which these works are reproduced in the cheaper material.

M. Barbezat's and M. Durenne's fountains.

Both Barbezat and Durenne exhibit works of large size in the park, near the entrance from the Pont de Jena, but these are only extensions of the specimens of which mention has been made. The large fountain exhibited by Durenne is the same as that erected in the Royal Horticultural Gardens at the International Exhibition of 1862, with which one by Barbezat, on an even greater scale, successfully competes. These fountains cast in iron and bronzed are a mistake since oxydisation is inevitable, and their ultimate destruction equally so, even under the best and most favourable circumstances of atmosphere and position.

Durenne,
Ornamental
iron castings

In addition to the figure subjects, animals, &c., all of which it is not necessary to indorse in an artistic sense, although all are equally interesting as examples of iron-casting, M. Durenne exhibits specimens of his perforated iron panelling for doors, &c., and decorative *repeats* for balconies, balustrades, &c. The casting of these ornaments is quite equal to the other works in beauty of surface and sharpness of detail, the designs being generally good, and well adapted to their purpose. They are exhibited in Class 40, and next to them is placed a collection of similar works contributed by E. Zegut, of Tusey (Meuse, No. 2). In this collection there are some admirable examples of ornamental iron castings of railings, balconies, and grilles, suitable for the purposes of ventilation in public buildings, and the smaller ones for door panels. The arrangement of some of the designs is very good, and thoroughly adapted to the material, mode of production, and the purpose of the article. Unfortunately the specimens are placed too high for close inspection, but those shown with the figure portion of Zegut's exhibit display equal skill with the works already quoted. The figures and groups have not the artistic quality of those by Durenne and Barbezat, but are equally well cast in all the main features.

E. Zegut.
Iron rail-
ings, &c.

Electro de-
posits in
iron.

ELECTRO DEPOSITS IN IRON.

Although not coming strictly within the official scope of this report, I think it desirable, on technical as well as artistic grounds, to call attention to a new feature in the manipulation of iron. M. Jules Feuquières exhibits a series of objects deposited in iron by the electro-galvanic process

Jules Feu-
quières.
Reproduc-

(Class 40, No. 266, and Class 8, No. 78). The perfect character of these deposits, even to the most refined detail of highly-finished repoussé and chasing, deserves attention. The closeness of the metal, the perfect surface and tint, render this method of producing small and refined objects for personal decoration, &c. a matter of interest to all engaged in the production of ornamental works in metal. In class 8, M. Feuquières exhibits a casket, which is a reproduction of a very artistic work; also a tazza, the plateau and stem of which are after Cellini, together with a shield and several plaques; all of a most artistic character in finish and detail.

MR. WALLIS
ON
BRONZES,
&c.

tions of
small art
objects.

BELGIUM.

BELGIUM

BRONZE WORK AND REPOUSSÉ.

There are only a few art-bronzes exhibited by Belgium. These are chiefly applied to the decoration of clocks contributed by A. Bogaerts, Antwerp (1). These cabinet groups are original in design and treatment, and are in the manner of the subjects of the early school of Flemish painting. The best is, however, placed in a somewhat incongruous position as a clock ornament. It represents a lady and gentleman of the period above indicated, standing on a balcony, which is placed over what may be unfortunately mistaken for a modern chimneypiece, the fireplace being reserved for the clock! This group, however, apart from its connection with the clock and its main adjuncts, is very admirable in design. The modelling and execution are quite refreshing, after the wilderness of commonplace which characterises so many of the subjects in the French bronze courts. A single figure in the same costume is another example worthy of notice. It is a lady standing at a "priedieu," with missal, beads, &c., about to perform her devotions. The third group is not so successful, either in treatment or design. As examples of bronze casting, chasing, &c. these works—together with those which accompany them, but which it has not been thought necessary to particularise—all go to prove that the Belgian bronzists are emulating those of France, but not imitating them.

A. Bogaerts.
Small
groups.
in bronze.

A very skilful specimen of repoussé in brass, a reduction of one of the panels in a door at the museum at Versailles, executed by M. E. Dryspontdt (3), is interesting as a proof of advancing skill in Belgium in the more refined processes of art as applied to metal-work.

Repoussé in
brass by M.
E. Drys-
pondt.

IRON.

Iron.

Some of the best specimens of iron casting in the Exhibition, especially of small details useful for a great variety of

MR. WALLIS
ON
BRONZES.
&C.

Récquillé &
Pecquer.

Decorative
castings.

purposes in the construction and decoration of buildings, are exhibited by Messrs. Récquillé and Pecquer, of Liège (7). The sharpness, perfection of finish, and quality of the material, are all good evidence of the skill of the producers and that they have intelligence enough to bring both science and art to bear upon these manufactures.

The iron and brass castings which decorate the stoves, grates and fenders, of which there is a very pretty display in this section, show that Belgium can compete with Sheffield in this direction.

PRUSSIA.

PRUSSIA.

Fine art
bronzes.

Character
of treat-
ment.

As might be expected, from the traditional skill of the workers of Berlin in cast metals, the bronze and iron castings of Prussia are of a high class in the best and most representative examples. The style of finish varies as much from the French as the nature of the objects selected and the treatment of the modeller. This treatment is invariably more statuesque and architectonic, without running into severity or stiffness. The chasing, too, in the best examples, is careful without being mechanical; rarely, if ever, running into the English mistake of over-finish, to the destruction of the spirit of the original model. In short, the Prussian chaser is as much an artist as the modeller, and probably, in most instances, is the same individual; at least, there is strong evidence of this fact in the best examples.

BRONZES.

Bronzes.

H. Gladen-
beck.

The principal works in bronze are by H. Gladenbeck, of Berlin. Three of these may be quoted as especially worthy of close examination and careful study.

Model of
monument
to Frederick
the Great.

As a specimen of refined casting and chasing in bronze, the reduced reproduction of the great monumental erection at Berlin to the glory of Prussia, the equestrian statue of Frederick the Great, executed by Rauch, in 1856, is the most perfect example of German taste and skill in this direction. Every portion of the detail of this noble national monument is carried out with a conscientiousness quite unique; no point has been neglected. From the most elaborate and important down to the minutest detail of the work, all is in harmony. As a lesson in the bronzist's art it could scarcely be surpassed. Happily too, there is no affectation of colouring or tinting in any way; and the metal being thus left in its integrity, tells its own story, so to speak, without any adventitious adjuncts or trickery.

Albert
Wolff's
bronze
group.

Another remarkable specimen of art-bronze founding is a group, about one-fourth lifesize, of a young mounted Greek

MR. WALLIS
ON
BRONZES,
&C.

Character
of the ar-
rangement
as a casting.

killling a lion. This work is modelled by Albert Wolff, and cast by Gladenbeck. It is of the same type of subject as the Amazon, by Kiss, exhibited at the Great Exhibition of 1851. The arrangement of the parts for the purpose of sustaining each other, and yet preserving the utmost freedom of action, in horse, rider, and lion, is very skilful. There is no sacrifice of art to the exigencies of production, but both are made distinctly subservient to each other, and both unite to produce a complete result. The horse rears on his hind legs, one foot being placed on the inside of the thigh of the fallen lion, the other resting on the base. The lion, wounded by a spear broken in his side, rises with his head, chest, and fore legs, and is dashing, open mouthed, at the fore quarters of the horse, having already struck him with one of his claws. This claw and the fore leg is made to support the whole weight of metal in the mounted figure, the fore legs, head, and four quarters of the horse. The rider is poised in his seat with a graceful and vigorous action, as he is about to strike the lion with another spear which he holds ready in his right hand. As a work of art, this bronze is very fine; but as a casting, and as an example of the skilful arrangement of materials in perfect quantities, it is a lesson of no ordinary character.

Colossal
bronze
statue of
the late
King of
Prussia by
Deaks.

The third work to be noticed from Gladenbeck's foundry is a colossal equestrian statue of the late King of Prussia, modelled by Deaks, of Berlin. It was placed in the park in the avenue leading to the Ecole Militaire. As a work of art, it is somewhat stiff and formal: but the balance of the parts are well maintained, and in so large a work this is an important matter. The casting and finish are admirable.

F. Kahle &
Son.
Pair of
stags and
fountain.

A pair of stags, lifesize, and a fountain, by F. Kahle and Son, of Potsdam (21), also exhibited in the park, are good specimens of the founder's skill. The stags are noticeable for their chasing and finish, the style of which is admirably adapted to works to be placed in the open air. The fountain forms a subject for criticism on the design, which it would be useless to enter into here; but the work of the founder has been well done.

Commercial
bronzes.
H. Poyl &
Co.
Zimmer-
mann & Co.
A. Meves
Nachfolger.

There are three exhibitors of the usual class of works in bronze—that is, commercial bronzes—in the Prussian section. These are H. Poyl & Co., of Berlin (7); Zimmermann & Co., of Hanau (8); and A. Meves Nachfolger, of Berlin (9). None of the works range above the average excellence of ordinary bronzes of their class, but all certainly come up to this standard. The various groups of animals exhibited by Poyl are remarkable for severe treatment and the artistic finish of the details, which, however, sometimes runs into

MR. WALLIS
ON
BRONZES,
&c.

Colossal
statues of
Frederick
the Wise of
Saxony and
Philip the
Landgrave
of Hesse.

Cast iron.

Count
Einsiedel.
Iron doors,
&c.

Count Otho
de Stolberg-
Wernigerode.

Iron gates
bronzed.

Cast-iron
table top

hardness ; but is always intelligent. The character of the finish in these works is very different to that of the French. It never runs into the mechanical, whilst the affectation of gilt details and the introduction of a variety of tints in the same bronze is avoided.

Two large and important works are exhibited by Count Einsiedel, of Lauchhammer (14), together with a few small objects in bronze. These colossal statues of Frederick the Wise, of Saxony, and Philip, the Landgrave of Hesse, are thoroughly German in character. They are large in treatment ; with an intelligent attention to costume. The finish is excellent as applied to works of colossal size. The artist has evidently studied, and with decided success, to render the moulding as easy as possible, the parts being kept in masses ; yet nothing is sacrificed either in the way of truth of effect, dignity of pose, or artistic arrangement, to the exigencies of making the cast practically in one piece.

CAST IRON.

In addition to these colossal bronze statues, Count Einsiedel exhibits some very remarkable specimens of iron-casting. A panelled iron door forms the centre of the group of which the two bronze statues are the lateral supporters. It is an elaborate and successful example of iron-casting in the best manner. The design is admirably adapted to bring out the skill of the moulder and founder, and to show to what extent finish in this material can be carried in the casting pit or frame in skilful hands. The details of the ornamentation are very perfect, especially in the floral design in the panels. The figures are a little hard in effect, but this is a general characteristic of German castings of the draped figure.

Count Otho de Stolberg-Wernigerode, of Ilsenbourg (13) exhibits, as the central object of a very remarkable series of castings in iron, a pair of gates, bronzed by the electro-galvanic process. These gates have side columns of very elaborate design and workmanship. Two figures, one an armed Minerva and the other a Victory, occupy the space of the upper panels. The Prussian eagle is in a circular compartment in the centre of each division, and below are emblems of navigation and commerce. The other portions of these gates are filled up with ornamental scroll work, formed chiefly of a treatment of the vine. The columns are the least successful portion of the work, but they have the merit of being adapted to their position.

Another excellent example of iron bronze is a table top of large size. The ornament is perforated work in the moresque

manner. Its size renders it very notable as a casting, whilst the workmanship and design are alike admirable.

MR. WALLIS
ON
BRONZES,
&c.

Ornamental
castings in
iron.

The unbronzed iron castings comprised in this exhibit are all of a most refined character, whether as coming direct from the sand, as many of them do, or highly finished and mounted. In fact, they are the most perfect examples of iron casting ever produced. The subjects are mostly those which it has been usual to copy by the electro-deposit process in copper. Two or three plateaux, after the originals, in pewter, by François Briot, are wonderfully perfect in the detail; and a large circular salver, with the subject of the Battle of the Amazons—the original, in the possession of the King of Prussia, being embossed in repoussé by Vechte—is exhibited in the precise condition in which it has been taken from the sand. In fact, this material still adheres to parts of it, and yet the artistic and minute details of the original are given with singular sharpness and spirit.

The Vechte
salver,
the battle of
the Ama-
zons.

The Royal Foundry at Berlin contributes two magnificently executed works in iron. One is a sleeping lion and the other a lion arousing. These castings have been “dressed” and chased with great skill, the whole surface having been carefully wrought to a state of semi-polish. The skill shown in the modelling and treatment is artistic and sculptural, although the type of the lion is conventional.

The Royal
Foundry at
Berlin.
Castings of
lions.

Another object from this establishment is worthy of special consideration. It is a vase, about 18 in. high, of Roman form. The base and neck are of bronze, damascened, and decorated with castings in iron. The central portion of the body of the vase is filled with bas-reliefs, representing scenes in the war of 1866, executed with great spirit and artistic skill. The handles are each surmounted by a figure of Victory. One stands on the prow of a boat, and the other upon a cannon, as indicative of naval and military triumph. The prow of the boat and the cannon rest upon an ornament which is cleverly arranged so as to divide the relief of the body of the vase into two distinct subjects. The two figures are very poor in conception and execution, and appear to have been an after-thought: the work would have been more complete without them.

Vase in
bronze
and iron.

HESSE.—BADEN.

HESSE—
BADEN.

There are a few castings in bronze silvered and iron bronzed of a very ordinary commercial character, not calling for special attention.

BAVARIA.

The only work in bronze of any pretensions is an excellent cast of a group of *athletæ*, with a pedestal of bronze. This

BAVARIA.

MR. WALLIS
ON
BRONZES,
&c.

is from a model by Molen, of Stockholm, and is the production of the foundry of Messrs. Leng Brothers and Herold, of Nuremberg. It is well executed and finished, and has been cast in one piece, except two arms, which are "fired on."

Nicholas
Simon.

Animals
cast in iron
and treated
with colour-
ing material.

One of the most curious and original exhibits of works in cast iron is to be found in the Bavarian section (1). Nicholas Simon, sculptor, of Munich, contributes a stag, a roebuck, and a chamois, modelled by him of the size of life, and cast in iron, which he has afterwards treated with coloured material, sand, &c., inserting glass eyes, and giving them a singularly close appearance to specimens of the art of taxidermy. Of course, on close examination, this appearance is modified by a certain rigidity in the details. At a short distance the texture, however, is cleverly imitated. As metal castings these works are good. The stag was cast by Messrs. Gienauth Brothers, of Eisenberg; the roebuck and chamois at the Royal Foundry of Obereschstædt.

Indissoluble
plaster for
models in
cast iron.

M. Simon claims to have discovered an indissoluble plaster with which he can build up his model in the manner of clay and then use this model, when finished, for the purpose of moulding direct for the iron casting, as this plaster forms a concrete which is not affected by the wet or "green" sand.

There are two or three examples of the application of this method of production exhibited in the furniture department of the Bavarian section (class 14). They are stags' heads, tinted as above described, and mounted as decorations for entrance-halls, &c.

AUSTRIA.

AUSTRIA.

The Impe-
rial Foundry
at Vienna.

The art bronzes of Austria are confined to those exhibited in the Fine Arts Gallery, and are the production of the Imperial Art Foundry at Vienna. As examples of artistic metal casting and chasing, they are of a high class. The treatment is essentially metallic and approaches, in some particulars, to hardness in the rigid care with which the details are carried out. The surface is treated as a "mat," and the bronze is uncoloured. There is no affectation of burnish or variation of surface of any kind. The result is a sculpturesque effect of the purest character. The largest works are four busts, lifesize, of eminent statesmen and ministers of the Emperor of Austria—Schmerling, Viszanik, L. Epstein, and C. Eral. These are all modelled by the sculptor, C. A. de Fernknor. The other works are four equestrian statuettes, treated with great skill and admirably chased and finished, by the same artist. The subjects are Baron Jelacic, St. George overcoming the Dragon, Arch-

Bronze busts
and statu-
ettes.

duke Charles of Austria, and Prince Eugène of Savoy. They are of small dimensions, and mostly reductions from larger works. Fernknor also exhibits a bronze model of a colossal fountain for the Bourse at Vienna, but it is not a work of any special interest.

MR. WALLIS
ON
BRONZES,
&c.

The contrast of treatment between these small bronzes and those of the French is very great. Undoubtedly the French gain in *technique* by the comparison, if they lose in true art-quality.

The commercial bronzes of Austria are chiefly small works of a fanciful character, consisting of conceits composed of the accoutrements of the chase, dogs, animals killed in hunting, machines and machinery, emblems of art and science, some of which appeared first in the International Exhibition of 1862. The principal exhibitors of these objects are Dzifdzinski and Hanusch, Louis Boehm, Theodore Klein, Auguste Klein and Clement Lux, all of Vienna. The details of these works are finished with great care and precision, and present features of art-workmanship not paralleled in this class of exhibits. They are either gilt or silvered, the silver being mostly oxydised to a grey black. The effect of these latter works is very pleasing, especially in those groups in which machines, or the details of machinery, form a principal feature.

Commercial
bronzes.

The specimens exhibited by Dzifdzinski and Hanusch (7) are the most remarkable for size and variety of subject, as also in having less of the merely fanciful in design in their composition as art-works. A toilet mirror and pair of candelabra en suite are especially elegant and novel. The enamelled work inserted in ormoulu, round the mirror frame, is a happy and artistic relief to the whole. There are two copies of this design—one silvered and oxydised, and the other in ormoulu; but the former is the most artistic in effect.

Dzifdzinski
& Hanusch.
Objects in
bronze,
silvered and
oxydised.

SPAIN.

DAMASCENE-WORK.

SPAIN.

There are no bronzes in the Spanish section; but the very excellent specimens of damascene-work exhibited by Zuloaga and Sons, of Madrid, more than compensate for their absence.

Damascene
work.
Zuloaga &
Sons.

These examples of the modern skill of the successors of the Moorish metal-workers of a past age are the most notable objects of their class in the Exhibition. The cover of a portfolio, divided into panels of open work, chiselled with the most exquisite skill, the whole being chased in the most delicate relief, is a triumph of metallic art. The damascene-work proper, forms the ornamentation of the inside. A double

MR. WALLIS
ON
BRONZES,
&c.

Shields,
vases, &c. in
Damascene
work.

inkstand and writing-case, united in one design, is treated *en suite* with the portfolio-cover, the latter, in fact, being an appendage to the former, but is the most original work of the two. A pair of vases and four shields, all of damascene-work, of the most elaborate character in design and excellence of execution, form the remaining portion of Zuloaga and Sons' small but very remarkable exhibit, which is certainly unique of its kind, and deserves special and careful examination by all interested in the production of artistic metal-work of the highest class. Illustrations or lengthy descriptions are quite inadequate to do practical justice to the real character of such works. They are, somewhat singularly, placed in Class 36, Jewellery, &c. (40).

DENMARK
and SWE-
DEN.

DENMARK.—SWEDEN.

None of the objects exhibited by these countries in Class 22 are properly placed, but belong to Class 21; or, as specimens of electro-metallurgy, to Class 40.

RUSSIA.

Fine Art
bronzes.

The bronzes exhibited in the Russian section of the gallery of the Fine Arts by N. Lieberich present features so very different to those which characterise the French examples, as to almost suggest that they are produced in another material and by a totally different process. The works are eminently worthy of study, especially by the young modeller for metal-work. Not that every point is worthy of imitation, but as showing the result of a painstaking and conscientious study of nature in combination with accurate artistic perception, and a thorough knowledge of the conditions on which the subjects of study were to be reproduced in metal.

Lieberich,
groups in
bronze:

As specimens of moulding and casting they are unique. There is no merely conventional treatment in the chasing, which has been strictly subordinated to completing the idea of the original modeller, and nothing more; a most important point to be borne in mind, in what should ever be considered as a supplementary process. The most elaborate group is that representing the Emperor Alexander II. saving the life of a hunter in a bear-hunt. The principal figure, that of the Emperor, is about 20 in. to 22 in. in height. The treatment of the whole subject is most elaborate, and is, of course, more picturesque than sculptural. Another notable subject is a bear seated on his hind quarters awaiting the attack of a hunter. This and the bronze representing a hunter in the clutches of a bear which he has stabbed in the belly with a hunting-knife, are very ably executed works. These three works, as also most of the others, are by

Aubepuxb. The most instructive among the smaller examples, and certainly the most careful and artistic study, is that of a dead stag laid upon a rush mat. The drawing, modelling, and chasing are excellent, and worthy of careful examination.

MR. WALLIS
ON
BRONZES,
&C.

Several of the works were exhibited in the International Exhibition of 1862; as, for instance, the group of the Laplander driving four reindeer—a work of great spirit, and skilfully carried out.

Reindeer
group
of
bronze

There are a few well-executed and characteristic works in bronze, &c. exhibited as specimens of manufacture, and occupying a portion of a court in the Russian section devoted to other industrial productions. Amongst these is a very interesting series of sixty-six small busts, in bronze, of the Sovereigns of Russia. They are reductions from the originals in marble and bronze, executed as a part of the decorations of a chapel commemorative of the event of the 4th of April, 1866—the escape of the Emperor of Russia from assassination. As a series, they possess historical value, and as works of art many of them are good. The casting and chasing, as well as the general style of finish, are skilfully managed. This series is exhibited by Felix Chopin, St. Petersburg. (1).

Commercial
and de-
corative
bronzes.

Busts of the
Sovereigns
of Russia.

Alexander Sokoloff (4) exhibits a few small bronzes of animals of a similar character to those of Lieberich in the Fine Art Gallery. An elaborately wrought portrait of the Emperor of Russia, in bronze repoussé, is also exhibited by Sokoloff, and is a work of considerable skill. As a likeness, however, it is mechanical, and the elaborate ornamentation around may be studied rather as an example of what to avoid than for imitation.

Alexander
Sokoloff.

Portrait of
the Emperor
of Russia.

A pair of brass doors, exhibited by Messrs. Hencke and Pleske, of St. Petersburg (2), are admirable examples of casting, chasing, finish, and fitting. Some portions of the ornament are treated with great skill. It is no uncommon thing to see bad “fitting” accompanying excellent details in decorative metal-work of this class; but in these doors this important point is carried out with exceptional skill.

Hencke &
Pleske.
Brass
doors.

Another illustration of Russian brasswork is a pair of candelabra exhibited by Nicholas Stange (5). There is a refreshing originality in the arrangement of the parts of the objects, and the ornamental accessories almost justify the somewhat hypothetical phrase of the catalogue, “dans le style Russe.” These specimens are models, probably on a reduced scale, of those executed for the Protestant church of St. Peter and St. Paul at St. Petersburg. A bronze medal of the exterior of this church is also exhibited by Stange. The ornamental details of the principal façade are executed

Nicholas
Stange.
Decorative
brass
work.

Bronze
model of a
church.

MR. WALLIS
ON
BRONZES,
&C.

with great taste and skill, and the whole work is finished with scrupulous care, every detail being carried out most conscientiously. This model is very suggestive in many points, as it is an enduring record, in a most pleasing and artistic form, of the features of the edifice it represents.

ITALY.

Reproduc-
tions of
antique
bronzes.

ITALY.

The Italian bronzes are chiefly reproductions either of full size or on a reduced scale of antique works. The skill shown in most of them is very great; in fact perilously so for purchasers travelling in Italy. The fractures, patina, stains, dints, and other damages incidental to disinterred objects of bronze art, are so skilfully reproduced, especially in the smaller and more portable examples, as to render some considerable insight into the "art and mystery" of the manufacture of old things from new materials indispensable before giving a judgment or making a purchase. One can, therefore, excuse the pertinacity with which an amateur who has seen an antique (?) bronze discovered in some classic spot, and dug up in his presence, adheres to his opinion that it is genuine in every particular.

It would be quite useless to note special examples of this *integrity* of reproduction, as nothing but a careful personal examination will be of the least value in forewarning collectors as to the only truth about the works—the truth of imitation.

Reproduc-
tions of
bronzes
from Her-
culaneum.

In the larger reproductions there is less elaboration of the incidental details of forged antiques, but the skill of imitation is none the less evident on that account. In the avenue of the fine art gallery are two specimens; one is a Mercury, in bronze, seated upon a rock carved in grey marble; the other is a Discobolus, with eyes inserted, in marble mosaic. Both are from originals found in the excavations at Herculaneum. The Mercury is wonderfully sharp in the details of the casting and finish. The wings attached to the feet of the Mercury might have been wrought by the hands of a chaser of to-day, except that the work is thoroughly antique in character.

The drunk-
en and
sleeping
fauns.

In the Italian annexe, in the park, placed with the pottery, there are bronze statues, the size of life, of two Fauns; both have rock bases carved in variegated grey marble. One is a drunken Faun stretched backwards upon a half-empty wine-skin, snapping his fingers upwards in the revelry of intoxication. The rock is covered with a panther-skin cast in bronze, but so arranged that it spreads thinly over the inequalities of the rock. The head, legs, paws, and tail are thus arranged as adjuncts, in metal, to the figure; and the skill shown in

casting renders the work, even as a reproduction, an admirable illustration of antique treatment in metal. The other is a sleeping Faun; and, although equally good in casting, &c., it has not the same interest as the first named.

MR. WALLIS
ON
BRONZES,
&c.
—

A reproduction, in bronze, of the colossal marble statue of "David" by Michael Angelo, in front of the Pallazzo Vecchio, Florence, is exhibited by Clement Papi, of Florence (5), and is placed in the fine art gallery. It is a good casting, well finished, and looks better in metal than one could have anticipated from the rounded, although strong, markings of the muscles. This reproduction of works in marble by casting in bronze seems to be adopted by the French, as already noted, to a greater extent than is always satisfactory; for a work adapted in its finish to marble, is rarely, if ever, equally well adapted to metal.

The statue
of David,
by Michael
Angelo.
Reproduc-
tion in
bronze.

The peculiarity of the larger examples of the Italian bronzes, above named, is the remarkable absence of any appearance of an artificial system of colouring the metal. Of course, this is simply an appearance, as in reality they are most carefully treated; but then this is done with great skill, and is evidently not the result of any sudden or violent chemical action. In short, the object of the Italian mode of treatment is to give as nearly as may be the tone and tint which time gives, and not a special colouring as part of the artistic effect to be produced, which is essentially the French system, tint being an element of finish.

Colouring
in imitation
of the
antique.

The modern Italian bronzes exhibited in the fine-arts section are a statue of "Cain" and a statuette of "Esmeralda." The former is of full size, and is from the Marini Foundry, at Florence. It partakes largely of the antique manner of treatment, but in parts is affectedly rude, yet always intelligent. The casting appears "rotten" at some points. The group of "Esmeralda," with the goat, tambourine, &c., is by T. Solaré. As an example of casting, it is good: but the modelling and chasing are mechanical, like the modelling and finish of most of the Italian marbles.

Modern
Italian
bronzes.

There are two or three busts and a reproduction of an antique candelabrum, which do not present any features requiring other mention than that already given as illustrating the peculiarities and special points of the Italian bronzes; whilst the commercial bronzes, apart from the antique reproductions, are small and insignificant.

UNITED STATES OF AMERICA.

The remarkable skill in iron-casting evidenced by the productions of the leading founders of New England, on which I had the honour to report in 1853, at the period of the

UNITED
STATES OF
AMERICA.
Progress in
casting
Fine Art
works.

MR. WALLIS
ON
BRONZES,
&c.

International Exhibition at New York, has culminated, as was to be expected, in the production of some admirable bronzes, now that the growing art-power of the country has been educated to the production of really artistic models. This was the defective point fourteen years ago, as comparatively few of the statues of public men executed in bronze or iron in the cities of the United States had any claim to be considered works of art, yet, as specimens of skill in casting, they bore evidence of great ingenuity and a thorough mastery over method and material.

The art-bronzes exhibited in the fine-arts gallery are all of more than average excellence as works of art; whilst, as castings and specimens of skill in chasing and finish, they are equal to the best European works.

M. J. Q. A.
Ward.

Bronze of
the Indian
hunter.

"The Indian Hunter and his Dog," by M. J. Q. A. Ward, of New York, is a very successful sculpturesque treatment of a picturesque subject, thoroughly adapted to the material in which the work is executed, and with a full apprehension of the conditions requisite to successful casting in metal. The chasing, finish, and colour of the bronze are all excellent. In some of the details the work possesses the best art-qualities of the most perfect French bronzes. This group is the property of the Central Park, at New York, and is intended to be placed there on its return from the Exhibition.

The lib-
erated slave.

The same qualities, as regards casting and chasing, distinguish the statuette of "The Liberated Slave," also by Mr. Ward, except that in this work there is a decided imitation of the most artificial qualities of the French decorative bronzes.

Lamel
Thompson.
Bronze of
the Emperor
Napoleon I.

Mr. Lamel Thompson's able statue of Emperor Napoleon I. is another proof of American skill in the treatment of art-works in bronze. The modelling of this statue is severe, and with a thorough appreciation of the subject. Such a work by any Frenchman would have inevitably gained him great praise and honour. The variation of tint and texture, though obvious, is not carried too far, if it is allowable at all. On this point objections have been already stated when treating of the French bronzes. The treatment of the celebrated *redingote grise* of the Emperor contrasts in texture with other portions of the work in a most legitimate manner. The whole of the details are characterised by careful execution, and the chasing of the more highly-finished portions is especially skilful.

These American fine-art bronzes are worthy of careful examination and study, alike as regards treatment, finish, and colour.

In the industrial portion of the Exhibition (class 22) there is only one exhibitor in the United States section—Messrs. H. Tucker and Co., of New York—but this exhibit is certainly the greatest novelty in the treatment of metals in the Exhibition. It consists entirely of ornamental works in cast iron—gaseliers, lamps for paraffin, clocks, &c.—to the surface of which a bronze tint of a more than ordinary permanent character has been given by an entirely new process. As a matter of course the tint is not absolutely permanent, as by no artificial means, metallic or otherwise, can iron be so covered or coloured as to prevent final oxydisation. The process has been patented, and is based upon the fact that iron heated to a given temperature is oxydised, or becomes *blue*, which, as is well known, is the means of preventing further oxydisation by the atmosphere up to a certain point. Mr. H. Tucker, taking this fact in conjunction with another, that vegetable oil carbonises at precisely the same degree of heat, has succeeded in inventing a method for the production of a bronze tint on iron of a most satisfactory character, which tint finishes the work whilst it protects the objects from further oxydisation under any ordinary circumstances. The oil is laid very thinly upon the surface of the metal, the article is subjected to the proper heat, and when cool the operation is completed.

MR. WALLIS
ON
BRONZES,
&c.

H. Tucker
& Co.

Cast-iron
coloured in
imitation of
Bronze.

New pro-
cess.

As an illustration of the permanence of this surface finish and tint, I may state that the gaseliers exhibited were hung up in the Exhibition building early in March last. The roof above admitted water upon them, and they were frequently saturated with it, prior to the opening of the Exhibition. To this must be added the fact that the dust (chiefly lime-dust) covered nearly everything exposed in the building during this period; yet, on examination, no change can be discovered in the surface of the metal, whilst it is quite certain that, had works of a similar kind in bronze been subjected to the same exposure and treatment, the finish of the surface and colouring would have been greatly deteriorated, if, indeed, the bronze itself had not become oxydised.

Permanence
of the finish
and colour.

It has been supposed that this method of tinting is similar to that employed for colouring steel pens, but it is not so. Steel pens, whether yellow, blue, or bronze colour, are coloured entirely by heat alone; and I am assured that no ferruginous metal, except cast iron, will take the bronze tint obtained by the use of oil carbonised by heat upon a surface which will be oxydised blue at the same temperature.

Of the character of the works as castings it will be sufficient to say that they are first-class examples of American skill; and, although moulded in “green” sand, are equal to

Nature of
the castings
and charac-
ter of the
iron.

MR. WALLIS
ON
BRONZES,
&C.
—

any "dry" sand decorative iron castings in the Exhibition. This gives an enormous advantage to the manufacturer in point of economy of production.

The greater portion of the ornamental iron castings produced in the United States are manufactured of charcoal iron; but Messrs. Tucker prefer anthracite or coal iron for their castings, as it is found that coal iron takes the required bronze tint more perfectly and readily than charcoal iron, possibly from the greater affinity of the carbonised oil for the metal.

The iron used in casting the specimens exhibited is a mixture of Scotch (Coltness) and two or three kinds of American, as experience shows that the quality of metal thus obtained runs more freely, and produces sharper and more definite castings than even charcoal iron, which is often fallacious in appearance, indurated and brittle on the edges.

I have gone the more carefully into these details because I regard the process now illustrated by Messrs. Tucker as an important one in its application to several British industries.

GREAT BRITAIN.

GREAT BRITAIN.

The main purpose of this report is to call attention to the best and most noteworthy productions of foreign countries for the information of British visitors, manufacturers, and others; it will therefore be sufficient to briefly glance at the few British exhibits in this class.

Thos.
Fowke.
Statuettes.

A very small display of bronzes is exhibited by Mr. Thos. Fowke, Park Lodge, Fulham, consisting of a few statuettes of figures in volunteer uniform. This constitutes the exhibits in the British section, in addition to a few well-known bronzes contributed by the Art Union of London, and the prize specimens of chasing included in the Society of Arts illustrations of the system of annual rewards to art-workmen, adopted by that institution.

Electro-
copper gates
for the
South
Kensington
Museum.

As a substitute for bronze, the doors for the South Kensington Museum may be quoted. These are executed by the electro-deposit process from the general design by the late Mr. Godfrey Sykes, the models having been produced, after his death, by his assistants, Mr. John Gamble and Mr. Reuben Townroe. This work is eminently architectonic, and is of value, as showing the extent to which the electro-galvanic process can be employed in the production of large and important objects of this class, and in the direct production of the artist's own work, without the introduction of those mechanical methods which involve the action of other minds and hands, to the deterioration of the original thought as expressed by the designer and modeller. In these doors

the entire spirit of the models has been kept in its integrity, by the process not necessitating any mechanical finishing in the metal. Doubtless such a process is a somewhat crucial test of the powers of the modeller; but in any case the beauties of a work are preserved intact, whilst the faults are not added to by the superfluous manipulation of the chaser in an attempt to finish details which the artist himself had no desire should be carried beyond the point which he thought necessary to the expression of his idea in the original model.

MR. WALLIS
ON
BRONZES,
&C.
—

Messrs. Elkington and Co. exhibit a large work in steel repoussé—the Elcho challenge shield—designed by Mr. G. J. Cayley. It is a notable example of considerable size, and is executed with great skill and precision. As an illustration of what can be done in steel by this method of ornamentation it deserves careful study and close examination. This work is a presentation from Lord Elcho to the volunteers of Great Britain and Ireland as a challenge prize.

Elkington
and Co.
Steel re-
poussé
shield.

As an example of iron-casting, a case for hot-water pipes, executed by Messrs. H. Hoole and Co., Sheffield (2), after a design by Mr. Alfred Stevens, for the South Kensington Museum, is to be noted for the admirable manner in which the work has been adapted to its purpose, and the decorative result produced by the repetition of a few well-considered but simple ornamental details.

H. Hoole &
Co.
Case for hot-
water pipes
in cast iron.

Another work in iron of a very different character, being altogether of wrought metal with repoussé decorations, is a pair of gates for a garden approach or terrace, executed and exhibited (Class 40, No. 4A) by Messrs. Barnard, Bishop, and Barnards, Norwich. The object has been, whilst following certain traditionary methods of execution, to produce a work without reference to any special style or precedent. Avoiding symbolism, a distinct reference to nature has been made for the ornamental details, and a design worked out, as a whole, which, whilst pleasing in its general effect, bears the impress of handicraft power dealing with a material which in modern times it has been the fashion to consider so unyielding in its character, that to bring it into a decorative form at all suited to modern wants and ideas it must of necessity be manipulated in the foundry rather than the smithy, and the art-forms moulded from a fixed model and cast into form from the crucible of the ironfounder, rather than emanate direct from the hands and brain of the cunning artificer, guided by the art-experience of the educated ornamentalist. Happily, however, file, nippers, shears, punch, and chisel have not been altogether superseded by model, matrix, stamp, die, and chasing tool. Thus, in this Inter-

Barnard,
Bishop, &
Barnards.
Wrought-
iron garden
or terrace
gates.

MR. WALLIS
ON
BRONZES,
&C.
—

Nature of
the design.

national Exhibition we see to-day efforts to bring back the handicraft power of the past, not so much to supersede the mechanical appliances of more recent times, but to supplement them; especially in works which are not required to be reproduced in numbers for the markets of the world.

It is not necessary here to go into descriptive details, which would occupy too much space and be of little or no practical value. The aim of the producers has been a high one; and if they have not achieved all that the designer aspired to, enough has been done to show how much may be effected by a clear and distinct perception of nature in its decorative character, of material in its adaptation to certain well-considered ends by traditionary means, and of handicraft power educated sufficiently in the elementary principles of art to work out intelligently, and with skill and tact, the thought of the artist.

The repoussé panels which are inserted into the upper and lower parts of the gates are notable for the breadth with which the various subjects upon them are treated. Foliage and blossoms, birds and butterflies, offer temptation to details which would have been very much out of place; yet the temptation has been resisted, and the artist-smith has preferred intelligent breadth to unintelligent minutiae—in short, power to weakness.

Treatment
of the de-
tails.

The treatment of the scrollwork and details of the American thorn, which forms the leading type in the foliated portions, is deserving of careful examination by workers and designers in this direction; and the same remark applies to the specimens of ornamental wrought-iron work exhibited by Messrs. Barnard, Bishop, and Barnards, in the architectural court.

The Skid-
more Manu-
facturing
Company.

The gable
frontal for
the Prince
Consort's
memorial.

The only remaining work of importance to which it seems desirable to call attention is this report is one of the gable frontals of the canopy to be placed below the *flèche* of the memorial to the Prince Consort, now erecting in Hyde Park, after designs by Mr. Gilbert Scott, R.A. This is a large and important specimen of wrought work in metal, and has been executed by Skidmore's Art-Manufactures Company, Coventry, by whom it is exhibited (3).

Novelty of
arrange-
ment of the
parts and
the effect.

As this work is a novelty in the construction and combination of metals and other materials, it is desirable to give such details as may make its peculiarities intelligible. It is one of four frontals, forming the principal features of the canopy, to be placed at a height of 75 ft. from the base. The angle-pieces forming the framework are of iron; and, to protect a material so liable to oxydisation from the action of the atmosphere, the surfaces are all covered with lead of

MR. WALLIS
ON
BRONZES,
&c.
—

about one quarter of an inch in thickness at the thinnest parts. Into this covering of lead jewelled details are inserted and firmly fixed by hammering up the pliable, but, so far as weather is concerned, durable metal. These jewelled details consist of various coloured marbles and granites, with crystals, onyx, agate, opal, jasper, cornelian, and other hard polished stones. To these are added, at suitable points, enamelled masses of different tints, giving variety and harmony to the colouring. The lead is left in its natural colour to form a background, so to speak, at certain points; at others it is richly double-gilt. The ridge decoration is of repoussé copper, and is highly ornamental. This, being also left in its natural colour, harmonises admirably with the polychromatic and gilt effects above named.

Style of the
work.

The style of work is a revival in the manner of the jewelled work of the thirteenth century, such as may be seen in the shrines of the cathedrals at Aix-la-Chapelle, Cologne, Tournay, and other places, with this important difference—that here we have an architectural work executed the full size required by the exigencies of the structure, and for erection in the open air; whilst the works of the Middle Ages were either reproductions, on a small scale, by the metal-workers and jewellers of the time, of edifices which had been erected, or in a similar style of art to such edifices, the design and detail being adapted by the handicraftsman to the more precious materials in which he was called upon to work.

Size, &c.

Large as the work appears in its present position, yet when seen fixed at the height of 75 ft. from the surbase of the monument, the effect will be that which has been so distinctly aimed at—that of the jewelled work of the best period of mediæval art.

CONCLUSION.

Conclusion

In concluding this report, I may be permitted to state that, as far as possible, every section of the class of objects included in the arrangement adopted by the French executive as belonging to class 22, of which there are examples in the Exhibition, has been examined and noticed, so far as I deemed them of practical value to the artist, the manufacturer, or the artisan. The objects specifically described appeared to me to possess points of special interest likely to be valuable to those engaged in the same or in kindred industries, or to present features which it seemed desirable to record among the achievements of art, science, and manufacture in their relation to each other. In this respect the object I have sought to accomplish has been to make this

The report
a lesson and
a record.

MR. WALLIS
ON
BRONZES,
&C.

report at once a lesson and a record—a lesson, so far as my experience and knowledge of art, as applied to manufacture, would enable me to apply the principles and practice accepted as the foundation of success in the great works of past ages, and even of the present time; and a record of such novel features as appear likely to influence the future, whilst indicating the progress of the past twenty years by the facts derived from personal experience and observation, the result of opportunities of a somewhat exceptional character, but which rendered the task undertaken so much the more difficult to fulfil to my own satisfaction.

REPORT ON HOROLOGICAL INSTRUMENTS.—(Class 23.)—
By C. R. WELD, Esq.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

BEFORE entering on the more immediate subject of this report, it will be desirable and instructive to compare the number of exhibitors of horological instruments at the Paris Exhibition of 1867 with the number who exhibited at the International Exhibition of 1862, classed according to their respective countries. They are as follows:—

In 1862, 300—namely, Austria, 10; Baden, 26; Bavaria, 1; Belgium, 1; Brazil, 1; Denmark, 5; France, 54; Hanse Towns, 3; Holland, 1; Italy, 4; Mecklenburg, 1; Norway, 3; Prussia, 6; Russia, 1; Saxony, 4; Spain, 2; Sweden, 5; Switzerland, 72; United Kingdom, 97; Wirtemberg, 3.

Number of
exhibitors.

In 1867, 535—namely, Austria, 28; Baden, 25; Bavaria, 4; Belgium, 6; Denmark, 6; France, 223; Greece, 1; Hesse, 1; Holland, 1; Italy, 10; Portugal, 1; Prussia, 14; Russia, 5; Spain, 1; Sweden, 2; Switzerland, 163; Turkey, 7; United Kingdom, 29; United States, 3; Wirtemberg, 5.

Thus it will be seen that there is an increase of 235 exhibitors in the horological class over those who exhibited in 1862; and it is also worthy of remark that not only are the exhibitors in the present exhibition more numerous, but also that the exhibitors generally have made a larger display of horological objects than were shown in 1862.

Among the numerous remarkable mechanical inventions which challenge our admiration in the great Paris Exhibition, not one can be regarded as more useful than that by which the passage of time is accurately registered. From the period when timekeepers in the form of the quaint “Nuremberg eggs” were invented, it has been the constant endeavour of horologists to improve the construction of horological instruments, and the efforts in this direction have been so successful that ships in the middle of vast oceans are enabled by means of chronometers to ascertain their position with extraordinary precision, and parties in dense forests provided with these instruments cut paths through the wilderness with unerring accuracy. To the marvellous precision of chronometers the laying of submarine telegraph cables is in a great measure due, and without their aid the picking up of the lost Atlantic cable could not have been effected without considerable loss of time, if, indeed, it could have been found at all.

Value of
chronome-
ters.

The chronometer maker is undoubtedly a most important person, for the very lives of thousands of persons are committed, so to speak, to his keeping; and thus it is but

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

"Error of
compensa-
tion."

Effects of
tempera-
ture.

Auxiliary
compensa-
tion.

natural that he should do all in his power to perfect the valuable instrument which it is his business to construct.

The great mechanical problem to be solved by him is known as the error of compensation, and to this almost every chronometer maker of repute has devoted a large portion of his professional life. How serious are the errors of a chronometer uncompensated for temperature will be apparent by the fact that a chronometer well made in all respects, but not compensated, when rated at the Royal Observatory at Greenwich, showed that there was a uniform decrease of rate for equal increase of temperature, measured by a mercurial thermometer, amounting to 6.11 sec. in 24 hours for each degree of Fahrenheit, a mean temperature of 8 deg., causing a daily losing rate of 142.5 sec., and a mean temperature of 40.9 deg. a daily gaining rate of 225 sec. It has been well observed that the early chronometer makers must have been sadly disappointed and terribly perplexed when they found that their mechanical skill, often of a very high order of excellence, was thus marred by the effects of temperature. To the navigator these excessive temperature errors are most important, admonishing him that he should be very careful that his chronometers have been properly adjusted for low and high temperatures by skilful and trustworthy hands before going to sea. To this end all eminent chronometer makers keep an ice-chamber always prepared to receive chronometers, as well as gas ovens or stoves.

Mr. Airy, the Astronomer Royal of England, in his report to the Admiralty relating to the performance of chronometers, states that the prevalent cause of their errors is defective compensation, often aggravated by the use of bad oil. Strange as it may appear to many readers, oil is one of the greatest stumbling blocks in the path of the chronometer maker. A fine, even, and perfect lubricating oil is absolutely essential for his purposes. For good oil as high a price as 6*l.* a pint is frequently paid; but even at this price it is extremely difficult to obtain really good oil. The best is that made from olives, but, generally speaking, chronometer makers use animal oils.

To correct the temperature-error of chronometers has therefore always been the chief aim of the makers of these instruments, and an extraordinary amount of ingenuity has been shown in devising various modes of auxiliary compensation. Indeed, the International Exhibitions of 1851, 1855, and 1862 have almost teemed with inventions of this description; and that of the present year presents numerous examples of this nature. Most of these, however, are merely modifications of the auxiliary compensations contrived by

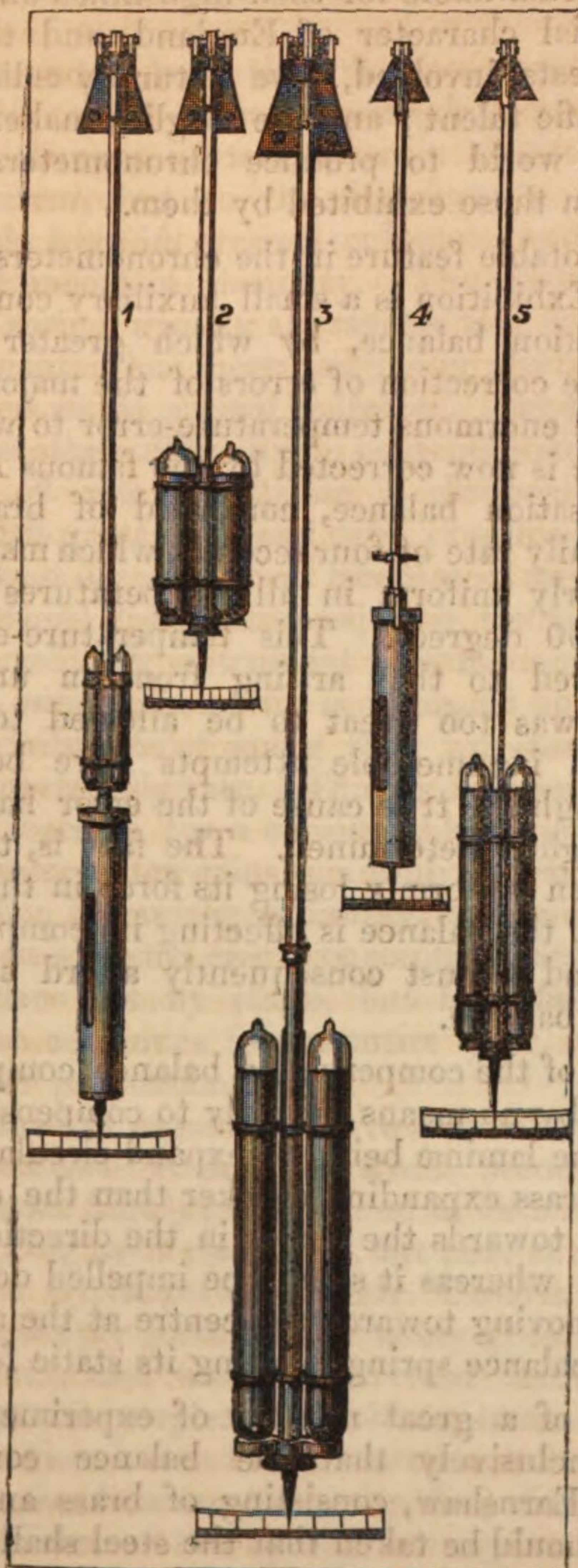
Mr. Charles Frodsham and Messrs. Molyneux, Eiffe, Ulrick, Pennington, and Arnold.

MR. C. FRODSHAM'S NEW BRASS TUBULAR COMPENSATION PENDULUMS WITH THE MERCURY HELD IN GLASS TUBES HERMETICALLY SEALED.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

—
ASTRONOMICAL
CLOCKS.

Compensation
pendulum.



No. 1. Making 72 vibrations per minute, with central compensation jar and auxiliary compensation tubes.

No. 2. Making 100 vibrations per minute, with double mercurial tubes.

No. 3. Making 60 vibrations per minute, with double mercurial compensation tubes.

No. 4. Making 80 vibrations per minute, with single mercurial compensation tubes.

No. 5. Making 72 vibrations per minute, with double mercurial compensation tubes.

Approximate scale, one-tenth.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Astronomi-
cal clocks.

English chronometer makers have long stood at the head of their profession; and the astronomical clocks and marine chronometers exhibited by them in the Paris Exhibition are on the whole remarkable for their high finish and excellence. The commercial character of England, and the enormous shipping interests involved, have naturally called forth the highest scientific talent; and the English makers may safely challenge the world to produce chronometers of greater excellence than those exhibited by them.

Compensa-
tion balance.

The most notable feature in the chronometers exhibited in the present Exhibition is a small auxiliary compensation to the compensation balance, by which greater accuracy is obtained in the correction of errors of the major or principal balance. The enormous temperature-error to which allusion has been made is now corrected by the famous Arnold-Earnshaw compensation balance, composed of brass and steel laminæ, to a daily rate of four seconds, which may be regarded as pretty nearly uniform in all temperatures between 30 degrees and 90 degrees. This temperature-error, though trivial compared to that arising from an uncompensated chronometer, was too great to be allowed to remain uncorrected, and innumerable attempts have been made to adjust it, though the true cause of the error has never until lately been rightly determined. The fact is, that while the spring has been uniformly losing its force in the direction of a straight line, the balance is affecting its compensation by a curve line, and it must consequently afford an inadequate compensation balance.

The action of the compensation balance, composed, as it is, of laminæ, is by no means friendly to compensation, the inclination of the laminæ being to expand circularly; and it is only by the brass expanding quicker than the steel that the mass is driven towards the centre in the direction of a hypotenusal line; whereas it should be impelled down a parallel central line moving towards the centre at the same uniform speed as the balance spring is losing its static force.

The result of a great number of experiments has been to prove conclusively that the balance constructed by Arnold and Earnshaw, consisting of brass and steel, is the best. Care should be taken that the steel shall never exceed the ratio of two to five of the brass. Both these metals expand in heat and contract in cold, unequally, however, the ratio of the former to the latter being as nearly three to two. The chronometer should then be adjusted to temperature from 55 degrees to 90 degrees, and the error arising from extreme cold corrected by the use of a small auxiliary compensation. Mr. Charles Frodsham's compensation

balances, involving various new constructions, have been found to answer their purposes admirably. His micrometric balance affords a very simple means of adjustment without removing the balance from the chronometer or disturbing its mean time.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

It may be stated here that the very best chronometers, after from 15 to 20 years' service, become nearly useless under wide changes of temperature. This is not due to mechanical error, but to the deterioration of the balance spring, which loses its original cohesion, and hence has an impaired and uncertain elasticity. The slightest particle of rust on the spring greatly aggravates this decay. Happily, if the chronometer has been originally good, a new balance spring will restore its normal character. But the chronometer maker has another difficulty to contend with. This is the acceleration of rate. Suppose a chronometer has been completed with great skill and care, examined and corrected until it has been divested of all mechanical errors, and what is technically termed timed and adjusted for isochronism and temperature until the instrument is pronounced to be almost faultless; no sooner, however, is it placed on the register to ascertain its daily rate of going than up starts this error of acceleration on its daily rate. This acceleration, too, is found, as a rule, to increase for a considerable period. Thus, supposing the chronometer gains uniformly, when first rated, one second per day, before the expiration of a month it will gain daily, say, in an extreme case, five seconds; and this acceleration takes place not by starts, but by a daily gradual increase; and so continues for an entire year, or perhaps two, only in a lesser proportion.

Accelera-
tion of rate.

Various plausible arguments have been adduced to account for this acceleration—such as the works becoming more free, the surfaces more highly polished and in better working gear, the balance spring more elastic, &c., but none of these assertions are borne out by experience. Mr. Charles Frodsham, to whom we are deeply indebted for many great improvements in chronometers, and who has devoted much time to the examination of this perplexing problem, states that the cause of this acceleration is due in a great measure to the process of hardening the balance-spring by fire, during which the molecular particles of the spring are separated to a violent degree, though they are again partially restored in the tempering, and afterwards by continuous vibratory motion they gradually re-arrange themselves more closely, thereby gaining strength and occasioning a daily acceleration of rate.

English chronometers are, in general, constructed to go two days, or fifty-four hours, and to be wound up daily. A

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Mr. C. Frod-
sham's as-
tronomical
regulator.

considerable number, however, are constructed to go eight days, and are to be wound up every seventh day.

Amongst a great number and variety of excellent astronomical clocks, marine chronometers, and superior portable clocks, with chronometer escapements and compensation balances, exhibited in the Paris Exhibition, it is almost invidious to particularize names. The following makers of these instruments may, however, be cited as exhibiting work of the highest order of merit, Mr. Charles Frodsham (United Kingdom, 10*), who exhibits an astronomical regulator combining all accumulated improvements, including new brass tubular mercury compensation pendulum, and connecting galvanic apparatus for recording the time of observations. This clock, which has been made for the Cambridge Observatory, United States, is undoubtedly the most perfect instrument of its kind in the present Exhibition, and well deserves particular examination. It is a model of the celebrated clock (991) made by Mr. Frodsham for the Melbourne Observatory. The results of the performance of this clock during three years were submitted to the jury, and pronounced to be the most remarkable for accuracy on record. Mr. Frodsham attributes the wonderful precision of this clock not only to its mechanical excellence, but also to the discovery that few pendulum rods are ever so perfectly homogeneous as to lengthen directly by heat and shorten directly by cold. On the contrary, experiments show that they often expand into a bow form. In submitting six rods to a temperature of 600 degrees, only one of the rods remained perfectly straight, and the others bowed and warped into such shapes as to be entirely useless until they were re-annealed; and what was even more surprising was the fact that the flat rods not only warped more than the round ones, but also warped edgeways. This was a great discovery, and of the more consequence as it led to important improvements in the going rate of clocks. All pendulum experiments made for the purpose of ascertaining the cause of their variations must be viewed with but little confidence, unless the rods have undergone the test referred to, viz., submitting them to a temperature of at least as high as 600 degrees.

Brass tubu-
lar compen-
sation pen-
dulum.

In consequence of the great expense of compensation pendulums constructed with steel jars and rods, Mr. Charles Frodsham has substituted well selected brass tubes, carrying mercurial compensators hermetically sealed contained in a

* Mr. Charles Frodsham, who acted as juror on the part of the British Commission for the class of horology, was necessarily excluded from the competition for prizes.

central tube, or a number held in guides. The diagram on a previous page is an accurate representation of these new pendulums, which are adapted for clocks making the following vibrations per minute—60, 72, 80, 100, and 120.

The following valuable rules for the construction of the new brass tubular compensation pendulum have been recently drawn up by Mr. Frodsham. The mercury is held in one central glass jar, in a brass tube, for seconds and other lengths. The seconds' length is equal to 39.13 in. $\times$ half the height of the brass stirrup, whose outside length is 13 in. $\times$ 45.64 in., say 45.5 in. approximately. The sidereal seconds' length is 1.180 shorter than the mean-time length universally.

Pendulums are easily and quickly regulated by applying the following rule:—Note the error in seconds and the time in seconds in which the error occurred—say 10 sec. per hour. Then multiply twice the length of the pendulum by the error, and divide by the time—viz., 3,600 seconds.

Mr. Frodsham also exhibits a new brass tubular compensation pendulum and a galvanic apparatus applied to astronomical clocks, in connexion with chronographs for recording the precise time that observations are made.

Although classed under philosophical instruments, the isodynamic clock escapement, invented by Richard F. Bond, and used in connexion with his fine astronomical clock (United States, 4), deserves record here. Mr. Bond claims as the chief merit of his escapement that it overcomes entirely the difficulty arising from the varying power transmitted by the wheelwork, and that the slight friction, being constant, is wholly uninfluenced by the latter. He also states that the power may be increased to a hundred times the amount necessary to drive the clock, supposing the machinery capable of sustaining the weight, without in the least increasing the friction of the pendulum, or in any way interfering with the extent or time of its vibration.

Isodynamic
clock es-
capement.

Mr. Bond has further discovered that by a very simple addition he can secure a magnetic break-circuit entirely free from the danger of oxydisation, which will not in any way influence the pendulum or disadvantageously impede any other mechanism of the clock, hitherto the chief drawback to all break-circuits. This break-circuit has been in operation for a year without adjustment or alteration, and has not been found to fail in any one instance.

The Graham
pendulum

Messrs. Parkinson and Frodsham (United Kingdom, 22) exhibit chronometers with various good modifications of laminæ auxiliary compensation balances. J. Poole (23) and V. Kullberg (17) also exhibit excellent chronometers. Mr. M. F. Dent (9) shows a marine chronometer fitted with a

Mr. M. F.
Dent's
marine chro-
nometer.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

new auxiliary compensation balance. This chronometer is only the second which has been fitted with this kind of auxiliary compensation. This first was tried last year in the public competitive trials at the Greenwich Observatory. It stood fourth in the order of merit in the published official report of the Astronomer Royal, and was purchased by the Government, on his recommendation, at an honorary price.

Mr. Dent also exhibits a marine chronometer with a new kind of flat-rimmed balance, recently invented by himself. The principle of its mode of action is the same as that of Dent's staple balance, the compensating weights describing in their change of position a curved path in the plane of the axis of the balance approximating to a circular arc. Compared with the ordinary balance, the moment of inertia of this new balance will diminish more quickly as the temperature rises above, and will increase more slowly as it falls below, any given mean. Mr. Dent apprehends that another defect to which all balances are more or less liable will be mitigated—that is, the tendency which their compound laminae have to “set” when exposed continuously for a considerable time to extremes of temperature, owing to their limits of elasticity being over-passed. This is expected to be mitigated by the form of the balance here exhibited permitting the laminae to be made longer and thicker than usual.

France, which stands next to England in the excellence of astronomical clocks and marine chronometers, contributes several admirably constructed instruments. Those exhibited by L. Breguet (7), O. Dumas (2), A. Le Roy (63), B. Scharf (3), A. Jacob (6), A. H. Rodanel (8), and S. Vissière (29) are especially deserving of notice. The regulator exhibited by M. Breguet is remarkable for its new system of independent seconds and aluminium compensation pendulum.*

The Graham
escapement.

It is a remarkable fact that whilst a very large proportion of French exhibitors show an infinite variety of remontoir gravity escapements in connexion with astronomical clocks, all their energies seem to have been exclusively directed to this point, to the losing sight of the pendulum on which the uniformity of rate ultimately depends. Among the French astronomical clocks, all worthy of notice are constructed with the well-known Graham escapement, as well as with the mercurial compensation pendulum. There are also a few zinc pendulums of equal antiquity, the originals of which were invented as far back as 1773, by M. Rivaz, of Paris.† This

* M. Breguet, being a juror in the class of horological instruments, was excluded from the list of competitors for prizes.

† See Berthoud's “*Traité d'Horlogerie Marine.*”

pendulum was much used formerly by Breguet and Arnold. The latter employed it in one of the standard clocks for the Pulkowa Observatory in Russia, on account of the excessive cold in that climate occasionally freezing mercury.

It is worthy of remark that the beautiful and elaborate gridiron pendulums, of which the French made a splendid display at their Exhibition in 1855, are almost entirely absent on the present occasion. Grandjean and Co. (Switzerland, 25), exhibit the best Swiss chronometers; and A. Hohwu (Holland, 1) shows an excellent marine chronometer constructed on English movements, the auxiliary compensation balance being the check-piece of the celebrated English chronometer maker, Eiffe. M. Hohwu also exhibits a good astronomical clock, with Graham escapement and a mercurial compensation pendulum.

F. Tiede (Prussia, 11) exhibits a clock with electro-magnetic escapement, professing to go in vacuum. According to M. Tiede, the mean error of this clock, as determined during observations made for eighty-eight consecutive days—Nov. 9, 1866 to Feb. 5, 1867—was 0.038 sec. No trustworthy opinion could, however, be formed in the Exhibition of the performance of this clock, as the vacuum was found on trial to be imperfect, nor was the clock acting in accordance with the barometrical indications.

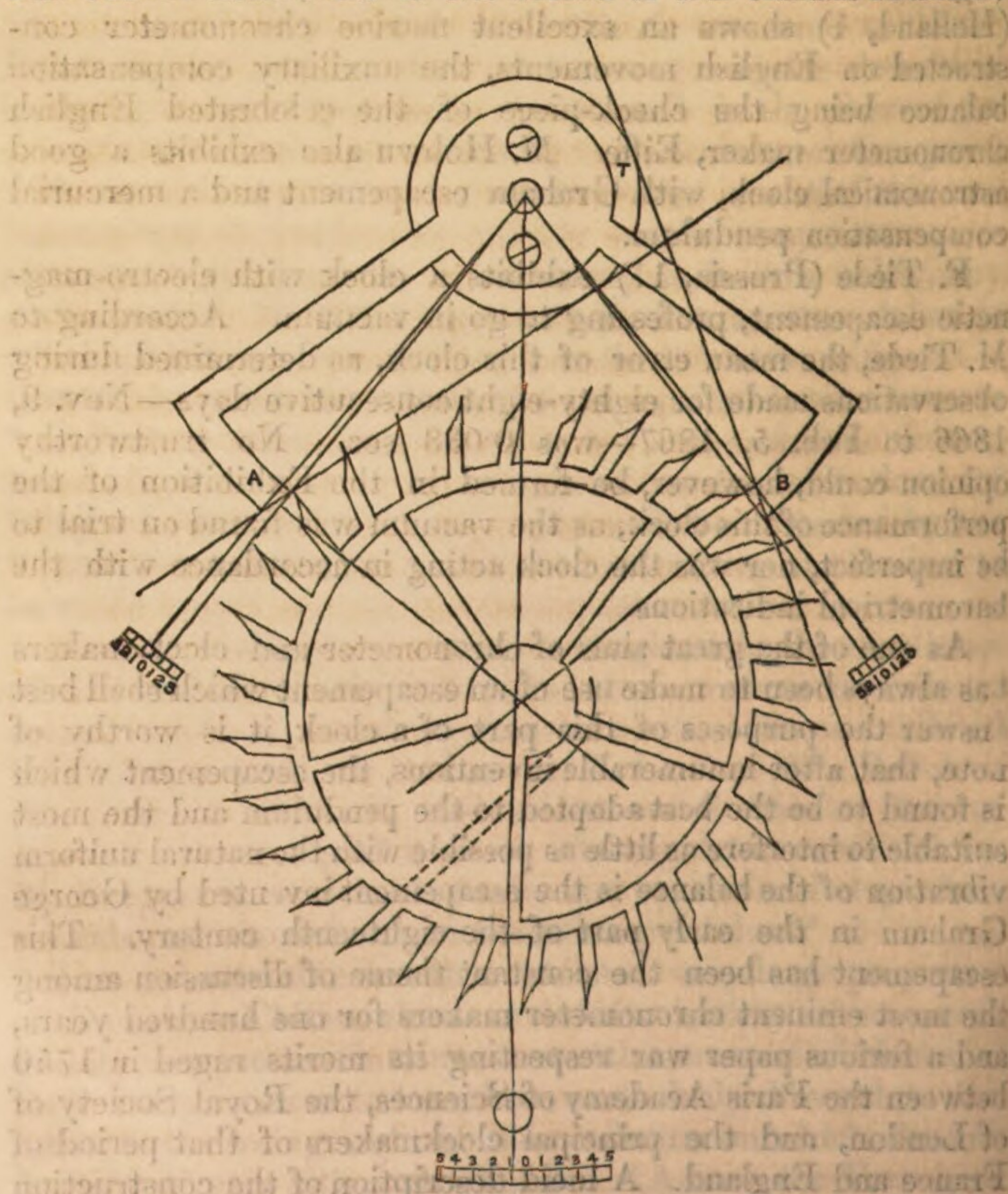
As one of the great aims of chronometer and clock makers has always been to make use of an escapement which shall best answer the purposes of this part of a clock, it is worthy of note, that after innumerable inventions, the escapement which is found to be the best adapted to the pendulum and the most suitable to interfere as little as possible with the natural uniform vibration of the balance is the escapement invented by George Graham in the early part of the eighteenth century. This escapement has been the constant theme of discussion among the most eminent chronometer makers for one hundred years, and a furious paper war respecting its merits raged in 1750 between the Paris Academy of Sciences, the Royal Society of London, and the principal clockmakers of that period of France and England. A lucid description of the construction of this escapement, by Graham's head workman, Thomas Skelton, will be found in the *Gentleman's Magazine* for March 1752. The illustration on the next page shows the Graham escapement on the system of Mr. Charles Frodsham.

The diameter of the escape-wheel is $2\frac{1}{4}$ inches, and the pallets embrace 9 teeth or $8\frac{1}{2}$ spaces. The most important point in the escapement is the distance of centres of the escape-wheel and pallet axis.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

This escapement possesses such great interest that it is considered desirable to annex an illustration of it, with the view of endeavouring to settle the long-vexed question with regard to the best form of this important movement. Notwithstanding the evident merits of this escapement, it has been one of the most fertile subjects of argument among chronometer and clock makers during the last three international exhibitions. The parties may be said to be divided

THE GRAHAM ESCAPEMENT ON THE SYSTEM OF MR. CHARLES FRODSHAM,



T. The tangent circle which determines the slopes and angular value of the pallet faces A B.

into two—the one advocating the remontoir and gravity escapement, the other the Graham dead-beat escapement; but the latter party, though agreed on the general principles, are greatly at issue on the details of construction. The principal difference consists in the number of teeth of the escape-wheel embraced by the anchor or pallets. The fewer the number of teeth embraced the shorter will be the arm of repose, and the

friction will necessarily be reduced to that ratio; but this subject of friction has been found to be a fallacy, for when the friction is reduced on the pallet rest it is increased on the angle of impulse. The friction has been found, moreover, to be of no detrimental importance; as a rule, it is equal to the sum of all other friction, and therefore admirably adapted to maintain a uniform vibration of the pendulum. The length of the pallet arms is the natural tangent to the semi-angle of the middle of the pallet pad; therefore the greater the number of teeth embraced in the anchor pallet the longer will be these arms.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Thus, if we were to embrace 12 teeth the length of the pallet arms would be as 5 to 26. A medium course has been adopted. Vulliamy embraced eight teeth. This number has many properties to make it a standard number, inasmuch as the length of the pallet arm is the radius of the escape-wheel; and that most important point in the construction of the escapement, the distance between the escape-wheel and the verge axes is the sum of the square of the radius—viz., 1.4142; and the chord of the angular opening of the pallets is equal to this distance—viz., 1.4142; but chronometer makers have preferred embracing larger numbers, as nine and ten. These are decidedly the best mean numbers to use, both in the construction of the highest and plainest work.

Under the head of first-class clocks for domestic use, those manufactured by English makers are the best. France, however, also exhibits excellent specimens. The clocks of A. Brocot (France, 81) are especially to be commended for their escapement pallets. The system adopted by this maker is called the pin-pallet escapement. It can be constructed with the smallest amount of drop, and is equally valuable for a highly-finished clock as it is for an economical one, or for clocks of small price. P. Drocourt (France, 99) exhibits numerous domestic clocks of great elegance and moderate price.

House
clocks.

Austria, Wirtemberg, Hesse, and the Black Forest are all admirably represented by good clocks, which display excellent workmanship, especially when considered in connexion with their prices.

The show of turret clocks is extremely limited; the most remarkable are those by J. W. Benson (United Kingdom, 4) and Gaurdin (France, not in catalogue). The latter exhibits a large clock made for Buffalo, United States. Chimes of 43 bells, with machinery by which the airs may be varied, are attached to this clock; these have been made by Bollee and Sons, of Mans, and are remarkable for their sweet tones.

Turret
clocks.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

L. C. Detouche, Paul Garnier, A. P. Borrel (France, 26, 28, and 34), and S. Fournier (United States, 3) also exhibit turret clocks. None involve any very novel construction; in all, however, the workmanship is extremely good. This applies especially to Fournier's clock, which is a most carefully constructed instrument. The paucity of turret clocks in the present Exhibition is the more remarkable as the French were extremely distinguished formerly for the manufacture of these timekeepers. The celebrated clock at the General Post Office in Paris, made by La Paute, is said to have cost 3,500*l.*, and is highly remarkable for its excellent mechanism.

Nearly all the turret clocks exhibited by France possess the remontoir and gravity escapement, and are of extremely complicated construction. It is also worthy of notice that while in England pendulums are generally used for turret clocks of 6 ft., 8 ft., and 14 ft. in length, with cylindrical bobs weighing from 100 lbs. to 500 lbs., the French seem in their pendulums rarely to exceed the second's length, and the average weight of the bob is not over 40 lbs. It may be also mentioned that the external dials are not of the large dimensions used in England; they are, however, as a rule, extremely neat.

Electric
clocks.

Electric clocks are not so numerous in the present Exhibition as might be expected from the excellence to which they have attained. The application of electricity to time has, however, several representatives. The clock exhibited by Paul Garnier (France, 28) is one of the best, combining various improvements. They may be thus enumerated:—The oscillations of the pendulum are independent of, and free of any influence from, the moving power (whether electricity or gravity). The pendulum is compensated. The rod, of white deal, is baked and soaked in a mixture of beeswax, oil of turpentine, and linseed oil, and then French polished, to prevent absorption of moisture. The compensation consists of a zinc tube (sheet zinc), resting on the adjusting nut at the bottom of the wood rod; the cast-iron bob rests on the top of the zinc tube by means of a plate screwed to the latter. The proportions are as follow:—The acting weight suspended from the curved lever, for the purpose of uplifting the impulse arms, is $2\frac{1}{2}$ drachms, exerting a pulling pressure (longitudinally) of about $\frac{1}{2}$ drachm at the point where the arms hold the curved lever, so that the actual force required to disengage the arms is a high fraction of a drachm, the hooks of the curved lever and the pin in the impulse arms being hardened and polished cast steel. Hence the pendulum becomes a correct timekeeper,

equal frequently, when due care is taken, to a first-rate astronomical clock. In the best form of electric clock the pendulum makes a contact at each oscillation by bending a spring, which in itself, as the temperature varies, will influence the rate of the clock. The manner in which the impulse is imparted to the pendulum is not entirely free from friction, and tends to produce "wobbling," as the impulse, although parallel, is not in the same plane as that in which the pendulum oscillates. The contact-makers are generally formed of iron cups containing mercury, into which dip pieces of copper with iron extremities. One enters the mercury at the moment the other leaves it, so that no spark from the direct current can oxydize the surfaces of the contact-makers, as both transmit the same current alternately—the left one to the magnet of the pendulum, the right one to the clock.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Attempts are being made by the French to introduce clocks constructed at Dieppe by machinery. They are in all respects greatly inferior to those made in other parts of France, and if their introduction be general, they will tend greatly to lower the character of French domestic clocks. As a rule, the result of attempting to manufacture clocks and watches by machinery in a plain way is soon to fall into a slovenly method, and thus to discourage good workmen. If the pride of highly-finished work is destroyed, first-rate hands can rarely be retained. The jurors of class 23 were greatly disappointed by the working parts of French clocks which had been constructed by machinery. They are far inferior to the work turned out in the villages of Lancashire, where the fabrication of our horological movements is carried on.

Machine-
made clocks.

Very ingeniously constructed small, portable alarm clocks are exhibited by T. Philippe (France, 52); they strike an alarm and light a candle. Their price is extremely moderate. A Knespach (Austria, 9) exhibits a collection of excellent domestic clocks, the prices of which are also very low.

Alarm
clocks.

POCKET CHRONOMETERS AND WATCHES.

No section of horology shows greater advance since the Exhibition of 1851 than that of pocket chronometers and watches. The most striking feature is an improved proportion of all the works; but the two most essential points of improvement are the increased weights and diameters of the balances, the importance of which in the construction of a pocket watch is now fully established. Although France makes a larger exhibition of watches than England, those

Pocket chro-
nometers
and watches.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

exhibited by the latter country are decidedly the best. The pocket chronometers and watches shown by Mr. Charles Frodsham, G. Blackie, M. F. Dent and Co., F. B. Adams and Son, V. Kullberg, Nicole, and Captain Parkinson and Frodsham, and J. Poole (United Kingdom, 10, 5, 9, 1, 17, 20, 22, 23) are in all respects admirable instruments.

The escapements principally in use formerly in watches were the chronometers or detached escapement and the duplex; these, though excellent in themselves, are not well adapted for these railroad days, because they will not bear rough usage. They have accordingly been almost entirely superseded by the lever escapement, which is particularly suited for all the ordinary usages of life; and, when all the other parts of the watch are of the same quality as the pocket chronometer, a most reliable timekeeper is obtained. A watch with an uncompensated balance spring is seriously affected by changes of temperature, particularly when not worn habitually. Ten degrees of Fahrenheit causes a watch to vary seven minutes per week; hence the difficulty of regulating watches except to the owner's particular wear; yet, if a watch be regularly worn, it is remarkable how nearly this error is balanced.

Great pains have been taken during recent years in England to improve the manufacture of ordinary watches. The best works are made in the Lancashire villages, and a considerable quantity of these works are annually exported to the United States, where they are cased and finished. According to the census of 1861, 23,427 persons were engaged in that year in the watch trade in England, the greater portion of whom resided in Lancashire.

Though the first-class chronometers made in France are, as a rule, inferior to those of English manufacture, they are—and especially when considered in relation to the very important question of price—very remarkable for their general excellence. Pocket chronometer and watch making have been hitherto but a very secondary manufacturing interest in France, but of late years it has greatly revived. L. Breguet, T. Le Roy, A. H. Rodinet, and L. M. Vichard (France, 7, 4, 8, 68) exhibit fine pocket chronometers and watches. M. Breguet, whose house has been long celebrated for its horological productions, also exhibits several interesting watches, among which may be noticed a keyless watch, with lever escapement, showing the phases of the moon; and a double watch, regulated by the reciprocal action of the two balances, which was made by A. L. Breguet, grandfather of the present M. Breguet, for Louis XVIII. M. Breguet also exhibits excellent chronographs.

It is, however, in cheap watches that France makes the greatest show. The efforts made by M. Goutard, of Besançon, to revive watchmaking in France, which were rewarded by a medal in 1862, appear to have been very successful. The clock and watch trade of France has, indeed, acquired enormous proportions during recent years. It is officially represented as amounting to 35,000,000f. annually. The principal seats of the trade are, for clocks, Paris; for watches, Besançon; and for large turret clocks, Monez (Jura). At Besançon 15,800 men, women, and children are employed in the manufacture of watch movements. There are 132 workshops, and 150 houses in the trade give out work to be executed in the private dwellings of the artisans. The Besançon watch trade manifests considerable improvement since 1855. Of 223 exhibitors in the French department of watches and their movements, 97 come from Besançon. In 1845 this town produced 51,192 watches; in 1855, 141,943; in 1865, 296,012; and the number is now said to surpass 300,000 annually. The declared official value of the watches and movements in 1866 was 17,000,000f. The principal establishment at Besançon is the Ecole Municipale d'Horlogerie, which maintains 250 pupils, and is directed by a professor.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

The Besan-
çon watch
trade.

said
watch

There is also a large watchmaking trade carried on at Cluses (Savoy), where there is a school for teaching watchmaking. St. Nicolas d'Aliermont is an important seat of this art; out of an adult population of 2,500, upwards of 1,000 are engaged in watchmaking. Astronomical clocks and chronometers are also fabricated here. The total number of time-pieces annually made in this town is stated to be 144,000, valued at upwards of 1,000,000f. They are for the most part sent to Paris. It is worthy of remark that for the more delicate workmanship women are preferred at St. Nicolas d'Aliermont to men.

The Cluses
watch trade.

While the reporter feels it to be his duty to cite the foregoing official statistics of the Besançon watch trade, he considers it right to state that the jurors of the horological class entertain considerable doubts how far the statement may be relied on, as searching investigations lead to the conclusion that a large proportion of watches and watch movements said to be manufactured at Besançon are really constructed in Switzerland. It is well known that, though nominally French, the Besançon watchmakers are of Swiss extraction, and their work greatly resembles that of the Swiss watchmakers.

An attempt has been lately made by some Paris watch-

MR. WALLIS
ON
BRONZES,
&c.

Nature of
the design.

national Exhibition we see to-day efforts to bring back the handicraft power of the past, not so much to supersede the mechanical appliances of more recent times, but to supplement them; especially in works which are not required to be reproduced in numbers for the markets of the world.

It is not necessary here to go into descriptive details, which would occupy too much space and be of little or no practical value. The aim of the producers has been a high one; and if they have not achieved all that the designer aspired to, enough has been done to show how much may be effected by a clear and distinct perception of nature in its decorative character, of material in its adaptation to certain well-considered ends by traditionary means, and of handicraft power educated sufficiently in the elementary principles of art to work out intelligently, and with skill and tact, the thought of the artist.

The repoussé panels which are inserted into the upper and lower parts of the gates are notable for the breadth with which the various subjects upon them are treated. Foliage and blossoms, birds and butterflies, offer temptation to details which would have been very much out of place; yet the temptation has been resisted, and the artist-smith has preferred intelligent breadth to unintelligent minutiae—in short, power to weakness.

Treatment
of the de-
tails.

The treatment of the scrollwork and details of the American thorn, which forms the leading type in the foliated portions, is deserving of careful examination by workers and designers in this direction; and the same remark applies to the specimens of ornamental wrought-iron work exhibited by Messrs. Barnard, Bishop, and Barnards, in the architectural court.

The Skid-
more Manu-
facturing
Company.
The gable
frontal for
the Prince
Consort's
memorial.

The only remaining work of importance to which it seems desirable to call attention is this report is one of the gable frontals of the canopy to be placed below the *flèche* of the memorial to the Prince Consort, now erecting in Hyde Park, after designs by Mr. Gilbert Scott, R.A. This is a large and important specimen of wrought work in metal, and has been executed by Skidmore's Art-Manufactures Company, Coventry, by whom it is exhibited (3).

Novelty of
arrange-
ment of the
parts and
the effect.

As this work is a novelty in the construction and combination of metals and other materials, it is desirable to give such details as may make its peculiarities intelligible. It is one of four frontals, forming the principal features of the canopy, to be placed at a height of 75 ft. from the base. The angle-pieces forming the framework are of iron; and, to protect a material so liable to oxydisation from the action of the atmosphere, the surfaces are all covered with lead of

about one quarter of an inch in thickness at the thinnest parts. Into this covering of lead jewelled details are inserted and firmly fixed by hammering up the pliable, but, so far as weather is concerned, durable metal. These jewelled details consist of various coloured marbles and granites, with crystals, onyx, agate, opal, jasper, cornelian, and other hard polished stones. To these are added, at suitable points, enamelled masses of different tints, giving variety and harmony to the colouring. The lead is left in its natural colour to form a background, so to speak, at certain points; at others it is richly double-gilt. The ridge decoration is of repoussé copper, and is highly ornamental. This, being also left in its natural colour, harmonises admirably with the polychromatic and gilt effects above named.

MR. WALLIS
ON
BRONZES,
&c.
—

The style of work is a revival in the manner of the jewelled work of the thirteenth century, such as may be seen in the shrines of the cathedrals at Aix-la-Chapelle, Cologne, Tournay, and other places, with this important difference—that here we have an architectural work executed the full size required by the exigencies of the structure, and for erection in the open air; whilst the works of the Middle Ages were either reproductions, on a small scale, by the metal-workers and jewellers of the time, of edifices which had been erected, or in a similar style of art to such edifices, the design and detail being adapted by the handicraftsman to the more precious materials in which he was called upon to work.

Style of the
work.

Large as the work appears in its present position, yet when seen fixed at the height of 75 ft. from the surbase of the monument, the effect will be that which has been so distinctly aimed at—that of the jewelled work of the best period of mediæval art.

Size, &c.

CONCLUSION.

In concluding this report, I may be permitted to state that, as far as possible, every section of the class of objects included in the arrangement adopted by the French executive as belonging to class 22, of which there are examples in the Exhibition, has been examined and noticed, so far as I deemed them of practical value to the artist, the manufacturer, or the artisan. The objects specifically described appeared to me to possess points of special interest likely to be valuable to those engaged in the same or in kindred industries, or to present features which it seemed desirable to record among the achievements of art, science, and manufacture in their relation to each other. In this respect the object I have sought to accomplish has been to make this

Conclusion

The report
a lesson and
a record.

MR. WALLIS
ON
BRONZES,
&C.

report at once a lesson and a record—a lesson, so far as my experience and knowledge of art, as applied to manufacture, would enable me to apply the principles and practice accepted as the foundation of success in the great works of past ages, and even of the present time; and a record of such novel features as appear likely to influence the future, whilst indicating the progress of the past twenty years by the facts derived from personal experience and observation, the result of opportunities of a somewhat exceptional character, but which rendered the task undertaken so much the more difficult to fulfil to my own satisfaction.

REPORT ON HOROLOGICAL INSTRUMENTS.—(Class 23.)—
By C. R. WELD, Esq.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

BEFORE entering on the more immediate subject of this report, it will be desirable and instructive to compare the number of exhibitors of horological instruments at the Paris Exhibition of 1867 with the number who exhibited at the International Exhibition of 1862, classed according to their respective countries. They are as follows:—

In 1862, 300—namely, Austria, 10; Baden, 26; Bavaria, 1; Belgium, 1; Brazil, 1; Denmark, 5; France, 54; Hanse Towns, 3; Holland, 1; Italy, 4; Mecklenburg, 1; Norway, 3; Prussia, 6; Russia, 1; Saxony, 4; Spain, 2; Sweden, 5; Switzerland, 72; United Kingdom, 97; Wirtemberg, 3.

Number of
exhibitors.

In 1867, 535—namely, Austria, 28; Baden, 25; Bavaria, 4; Belgium, 6; Denmark, 6; France, 223; Greece, 1; Hesse, 1; Holland, 1; Italy, 10; Portugal, 1; Prussia, 14; Russia, 5; Spain, 1; Sweden, 2; Switzerland, 163; Turkey, 7; United Kingdom, 29; United States, 3; Wirtemberg, 5.

Thus it will be seen that there is an increase of 235 exhibitors in the horological class over those who exhibited in 1862; and it is also worthy of remark that not only are the exhibitors in the present exhibition more numerous, but also that the exhibitors generally have made a larger display of horological objects than were shown in 1862.

Among the numerous remarkable mechanical inventions which challenge our admiration in the great Paris Exhibition, not one can be regarded as more useful than that by which the passage of time is accurately registered. From the period when timekeepers in the form of the quaint “Nuremberg eggs” were invented, it has been the constant endeavour of horologists to improve the construction of horological instruments, and the efforts in this direction have been so successful that ships in the middle of vast oceans are enabled by means of chronometers to ascertain their position with extraordinary precision, and parties in dense forests provided with these instruments cut paths through the wilderness with unerring accuracy. To the marvellous precision of chronometers the laying of submarine telegraph cables is in a great measure due, and without their aid the picking up of the lost Atlantic cable could not have been effected without considerable loss of time, if, indeed, it could have been found at all.

Value of
chronome-
ters.

The chronometer maker is undoubtedly a most important person, for the very lives of thousands of persons are committed, so to speak, to his keeping; and thus it is but

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Error of
compensa-
tion.²²

Effects of
tempera-
ture.

Auxiliary
compensa-
tion.

natural that he should do all in his power to perfect the valuable instrument which it is his business to construct.

The great mechanical problem to be solved by him is known as the error of compensation, and to this almost every chronometer maker of repute has devoted a large portion of his professional life. How serious are the errors of a chronometer uncompensated for temperature will be apparent by the fact that a chronometer well made in all respects, but not compensated, when rated at the Royal Observatory at Greenwich, showed that there was a uniform decrease of rate for equal increase of temperature, measured by a mercurial thermometer, amounting to 6.11 sec. in 24 hours for each degree of Fahrenheit, a mean temperature of 8 deg., causing a daily losing rate of 142.5 sec., and a mean temperature of 40.9 deg. a daily gaining rate of 225 sec. It has been well observed that the early chronometer makers must have been sadly disappointed and terribly perplexed when they found that their mechanical skill, often of a very high order of excellence, was thus marred by the effects of temperature. To the navigator these excessive temperature errors are most important, admonishing him that he should be very careful that his chronometers have been properly adjusted for low and high temperatures by skilful and trustworthy hands before going to sea. To this end all eminent chronometer makers keep an ice-chamber always prepared to receive chronometers, as well as gas ovens or stoves.

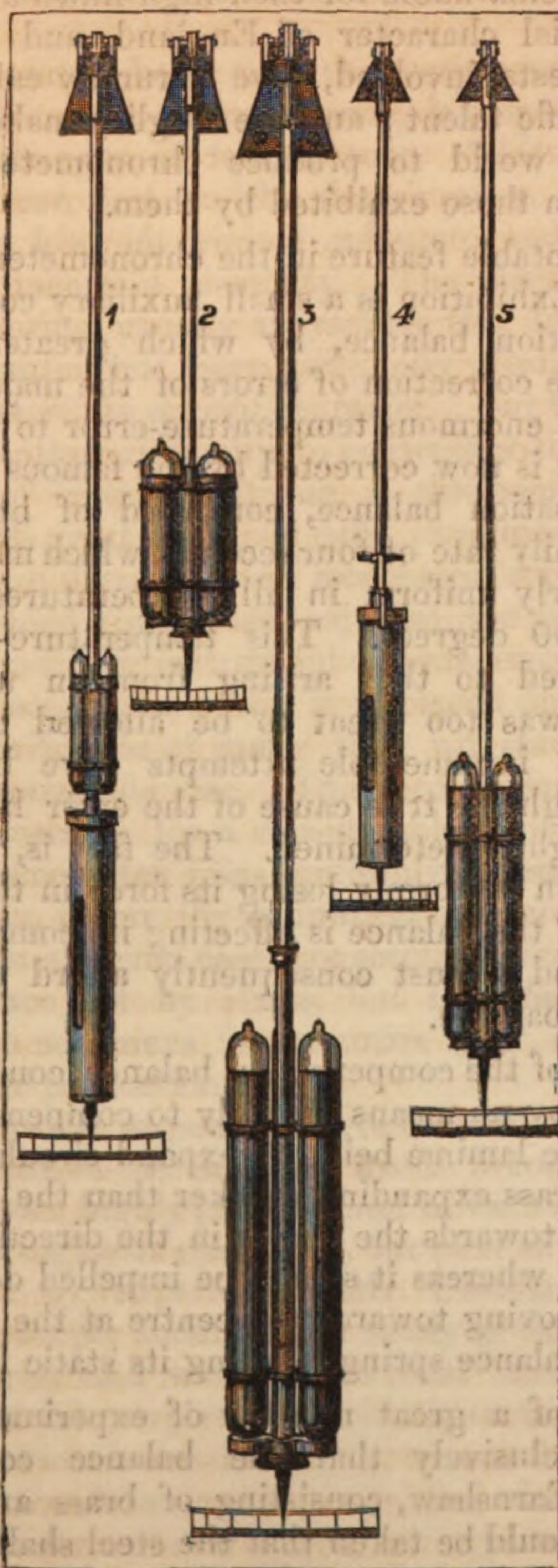
Mr. Airy, the Astronomer Royal of England, in his report to the Admiralty relating to the performance of chronometers, states that the prevalent cause of their errors is defective compensation, often aggravated by the use of bad oil. Strange as it may appear to many readers, oil is one of the greatest stumbling blocks in the path of the chronometer maker. A fine, even, and perfect lubricating oil is absolutely essential for his purposes. For good oil as high a price as 6*l.* a pint is frequently paid; but even at this price it is extremely difficult to obtain really good oil. The best is that made from olives, but, generally speaking, chronometer makers use animal oils.

To correct the temperature-error of chronometers has therefore always been the chief aim of the makers of these instruments, and an extraordinary amount of ingenuity has been shown in devising various modes of auxiliary compensation. Indeed, the International Exhibitions of 1851, 1855, and 1862 have almost teemed with inventions of this description; and that of the present year presents numerous examples of this nature. Most of these, however, are merely modifications of the auxiliary compensations contrived by

Mr. Charles Frodsham and Messrs. Molyneux, Eiffe, Ulrick, Pennington, and Arnold.

MR. C. FRODSHAM'S NEW BRASS TUBULAR COMPENSATION PENDULUMS WITH THE MERCURY HELD IN GLASS TUBES HERMETICALLY SEALED.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.



- No. 1. Making 72 vibrations per minute, with central compensation jar and auxiliary compensation tubes.
- No. 2. Making 100 vibrations per minute, with double mercurial tubes.
- No. 3. Making 60 vibrations per minute, with double mercurial compensation tubes.
- No. 4. Making 80 vibrations per minute, with single mercurial compensation tubes.
- No. 5. Making 72 vibrations per minute, with double mercurial compensation tubes.

Approximate scale, one-tenth.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Astronomi-
cal clocks.

English chronometer makers have long stood at the head of their profession; and the astronomical clocks and marine chronometers exhibited by them in the Paris Exhibition are on the whole remarkable for their high finish and excellence. The commercial character of England, and the enormous shipping interests involved, have naturally called forth the highest scientific talent; and the English makers may safely challenge the world to produce chronometers of greater excellence than those exhibited by them.

Compensa-
tion balance.

The most notable feature in the chronometers exhibited in the present Exhibition is a small auxiliary compensation to the compensation balance, by which greater accuracy is obtained in the correction of errors of the major or principal balance. The enormous temperature-error to which allusion has been made is now corrected by the famous Arnold-Earnshaw compensation balance, composed of brass and steel laminæ, to a daily rate of four seconds, which may be regarded as pretty nearly uniform in all temperatures between 30 degrees and 90 degrees. This temperature-error, though trivial compared to that arising from an uncompensated chronometer, was too great to be allowed to remain uncorrected, and innumerable attempts have been made to adjust it, though the true cause of the error has never until lately been rightly determined. The fact is, that while the spring has been uniformly losing its force in the direction of a straight line, the balance is affecting its compensation by a curve line, and it must consequently afford an inadequate compensation balance.

The action of the compensation balance, composed, as it is, of laminæ, is by no means friendly to compensation, the inclination of the laminæ being to expand circularly; and it is only by the brass expanding quicker than the steel that the mass is driven towards the centre in the direction of a hypotenusal line; whereas it should be impelled down a parallel central line moving towards the centre at the same uniform speed as the balance spring is losing its static force.

The result of a great number of experiments has been to prove conclusively that the balance constructed by Arnold and Earnshaw, consisting of brass and steel, is the best. Care should be taken that the steel shall never exceed the ratio of two to five of the brass. Both these metals expand in heat and contract in cold, unequally, however, the ratio of the former to the latter being as nearly three to two. The chronometer should then be adjusted to temperature from 55 degrees to 90 degrees, and the error arising from extreme cold corrected by the use of a small auxiliary compensation. Mr. Charles Frodsham's compensation

balances, involving various new constructions, have been found to answer their purposes admirably. His micrometric balance affords a very simple means of adjustment without removing the balance from the chronometer or disturbing its mean time.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

It may be stated here that the very best chronometers, after from 15 to 20 years' service, become nearly useless under wide changes of temperature. This is not due to mechanical error, but to the deterioration of the balance spring, which loses its original cohesion, and hence has an impaired and uncertain elasticity. The slightest particle of rust on the spring greatly aggravates this decay. Happily, if the chronometer has been originally good, a new balance spring will restore its normal character. But the chronometer maker has another difficulty to contend with. This is the acceleration of rate. Suppose a chronometer has been completed with great skill and care, examined and corrected until it has been divested of all mechanical errors, and what is technically termed timed and adjusted for isochronism and temperature until the instrument is pronounced to be almost faultless; no sooner, however, is it placed on the register to ascertain its daily rate of going than up starts this error of acceleration on its daily rate. This acceleration, too, is found, as a rule, to increase for a considerable period. Thus, supposing the chronometer gains uniformly, when first rated, one second per day, before the expiration of a month it will gain daily, say, in an extreme case, five seconds; and this acceleration takes place not by starts, but by a daily gradual increase; and so continues for an entire year, or perhaps two, only in a lesser proportion.

Accelera-
tion of rate.

Various plausible arguments have been adduced to account for this acceleration—such as the works becoming more free, the surfaces more highly polished and in better working gear, the balance spring more elastic, &c., but none of these assertions are borne out by experience. Mr. Charles Frodsham, to whom we are deeply indebted for many great improvements in chronometers, and who has devoted much time to the examination of this perplexing problem, states that the cause of this acceleration is due in a great measure to the process of hardening the balance-spring by fire, during which the molecular particles of the spring are separated to a violent degree, though they are again partially restored in the tempering, and afterwards by continuous vibratory motion they gradually re-arrange themselves more closely, thereby gaining strength and occasioning a daily acceleration of rate.

English chronometers are, in general, constructed to go two days, or fifty-four hours, and to be wound up daily. A

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Mr. C. Frod-
sham's as-
tronomical
regulator.

considerable number, however, are constructed to go eight days, and are to be wound up every seventh day.

Amongst a great number and variety of excellent astronomical clocks, marine chronometers, and superior portable clocks, with chronometer escapements and compensation balances, exhibited in the Paris Exhibition, it is almost invidious to particularize names. The following makers of these instruments may, however, be cited as exhibiting work of the highest order of merit, Mr. Charles Frodsham (United Kingdom, 10*), who exhibits an astronomical regulator combining all accumulated improvements, including new brass tubular mercury compensation pendulum, and connecting galvanic apparatus for recording the time of observations. This clock, which has been made for the Cambridge Observatory, United States, is undoubtedly the most perfect instrument of its kind in the present Exhibition, and well deserves particular examination. It is a model of the celebrated clock (991) made by Mr. Frodsham for the Melbourne Observatory. The results of the performance of this clock during three years were submitted to the jury, and pronounced to be the most remarkable for accuracy on record. Mr. Frodsham attributes the wonderful precision of this clock not only to its mechanical excellence, but also to the discovery that few pendulum rods are ever so perfectly homogeneous as to lengthen directly by heat and shorten directly by cold. On the contrary, experiments show that they often expand into a bow form. In submitting six rods to a temperature of 600 degrees, only one of the rods remained perfectly straight, and the others bowed and warped into such shapes as to be entirely useless until they were re-annealed; and what was even more surprising was the fact that the flat rods not only warped more than the round ones, but also warped edgewise. This was a great discovery, and of the more consequence as it led to important improvements in the going rate of clocks. All pendulum experiments made for the purpose of ascertaining the cause of their variations must be viewed with but little confidence, unless the rods have undergone the test referred to, viz., submitting them to a temperature of at least as high as 600 degrees.

Brass tubu-
lar compen-
sation pen-
dulum.

In consequence of the great expense of compensation pendulums constructed with steel jars and rods, Mr. Charles Frodsham has substituted well selected brass tubes, carrying mercurial compensators hermetically sealed contained in a

* Mr. Charles Frodsham, who acted as juror on the part of the British Commission for the class of horology, was necessarily excluded from the competition for prizes.

central tube, or a number held in guides. The diagram on a previous page is an accurate representation of these new pendulums, which are adapted for clocks making the following vibrations per minute—60, 72, 80, 100, and 120.

The following valuable rules for the construction of the new brass tubular compensation pendulum have been recently drawn up by Mr. Frodsham. The mercury is held in one central glass jar, in a brass tube, for seconds and other lengths. The seconds' length is equal to 39.13 in. $\times$ half the height of the brass stirrup, whose outside length is 13 in. $\times$ 45.64 in., say 45.5 in. approximately. The sidereal seconds' length is 1.180 shorter than the mean-time length universally.

Pendulums are easily and quickly regulated by applying the following rule:—Note the error in seconds and the time in seconds in which the error occurred—say 10 sec. per hour. Then multiply twice the length of the pendulum by the error, and divide by the time—viz., 3,600 seconds.

Mr. Frodsham also exhibits a new brass tubular compensation pendulum and a galvanic apparatus applied to astronomical clocks, in connexion with chronographs for recording the precise time that observations are made.

Although classed under philosophical instruments, the isodynamic clock escapement, invented by Richard F. Bond, and used in connexion with his fine astronomical clock (United States, 4), deserves record here. Mr. Bond claims as the chief merit of his escapement that it overcomes entirely the difficulty arising from the varying power transmitted by the wheelwork, and that the slight friction, being constant, is wholly uninfluenced by the latter. He also states that the power may be increased to a hundred times the amount necessary to drive the clock, supposing the machinery capable of sustaining the weight, without in the least increasing the friction of the pendulum, or in any way interfering with the extent or time of its vibration.

Isodynamic
clock es-
capement.

Mr. Bond has further discovered that by a very simple addition he can secure a magnetic break-circuit entirely free from the danger of oxydisation, which will not in any way influence the pendulum or disadvantageously impede any other mechanism of the clock, hitherto the chief drawback to all break-circuits. This break-circuit has been in operation for a year without adjustment or alteration, and has not been found to fail in any one instance.

The Great
Analogous

Messrs. Parkinson and Frodsham (United Kingdom, 22) exhibit chronometers with various good modifications of laminæ auxiliary compensation balances. J. Poole (23) and V. Kullberg (17) also exhibit excellent chronometers. Mr. M. F. Dent (9) shows a marine chronometer fitted with a

Mr. M. F.
Dent's
marine chro-
nometer.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

new auxiliary compensation balance. This chronometer is only the second which has been fitted with this kind of auxiliary compensation. This first was tried last year in the public competitive trials at the Greenwich Observatory. It stood fourth in the order of merit in the published official report of the Astronomer Royal, and was purchased by the Government, on his recommendation, at an honorary price.

Mr. Dent also exhibits a marine chronometer with a new kind of flat-rimmed balance, recently invented by himself. The principle of its mode of action is the same as that of Dent's staple balance, the compensating weights describing in their change of position a curved path in the plane of the axis of the balance approximating to a circular arc. Compared with the ordinary balance, the moment of inertia of this new balance will diminish more quickly as the temperature rises above, and will increase more slowly as it falls below, any given mean. Mr. Dent apprehends that another defect to which all balances are more or less liable will be mitigated—that is, the tendency which their compound laminæ have to “set” when exposed continuously for a considerable time to extremes of temperature, owing to their limits of elasticity being over-passed. This is expected to be mitigated by the form of the balance here exhibited permitting the laminæ to be made longer and thicker than usual.

France, which stands next to England in the excellence of astronomical clocks and marine chronometers, contributes several admirably constructed instruments. Those exhibited by L. Breguet (7), O. Dumas (2), A. Le Roy (63), B. Scharf (3), A. Jacob (6), A. H. Rodanel (8), and S. Vissière (29) are especially deserving of notice. The regulator exhibited by M. Breguet is remarkable for its new system of independent seconds and aluminium compensation pendulum.*

The Graham
escapement.

It is a remarkable fact that whilst a very large proportion of French exhibitors show an infinite variety of remontoir gravity escapements in connexion with astronomical clocks, all their energies seem to have been exclusively directed to this point, to the losing sight of the pendulum on which the uniformity of rate ultimately depends. Among the French astronomical clocks, all worthy of notice are constructed with the well-known Graham escapement, as well as with the mercurial compensation pendulum. There are also a few zinc pendulums of equal antiquity, the originals of which were invented as far back as 1773, by M. Rivaz, of Paris.† This

* M. Breguet, being a juror in the class of horological instruments, was excluded from the list of competitors for prizes.

† See Berthoud's “*Traité d'Horlogerie Marine.*”

pendulum was much used formerly by Breguet and Arnold. The latter employed it in one of the standard clocks for the Pulkowa Observatory in Russia, on account of the excessive cold in that climate occasionally freezing mercury.

It is worthy of remark that the beautiful and elaborate gridiron pendulums, of which the French made a splendid display at their Exhibition in 1855, are almost entirely absent on the present occasion. Grandjean and Co. (Switzerland, 25), exhibit the best Swiss chronometers; and A. Hohwu (Holland, 1) shows an excellent marine chronometer constructed on English movements, the auxiliary compensation balance being the check-piece of the celebrated English chronometer maker, Eiffe. M. Hohwu also exhibits a good astronomical clock, with Graham escapement and a mercurial compensation pendulum.

F. Tiede (Prussia, 11) exhibits a clock with electro-magnetic escapement, professing to go in vacuum. According to M. Tiede, the mean error of this clock, as determined during observations made for eighty-eight consecutive days—Nov. 9, 1866 to Feb. 5, 1867—was 0.038 sec. No trustworthy opinion could, however, be formed in the Exhibition of the performance of this clock, as the vacuum was found on trial to be imperfect, nor was the clock acting in accordance with the barometrical indications.

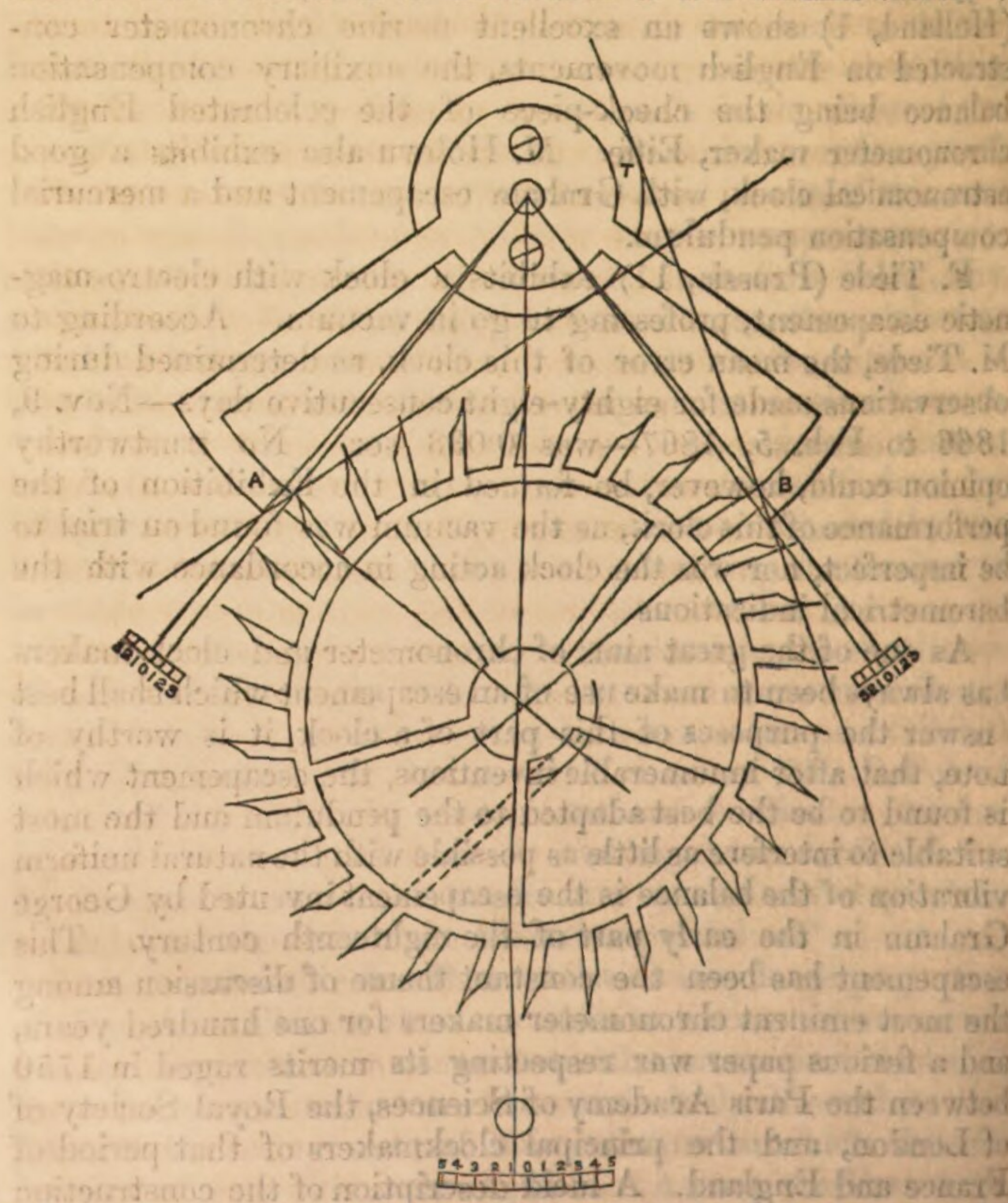
As one of the great aims of chronometer and clock makers has always been to make use of an escapement which shall best answer the purposes of this part of a clock, it is worthy of note, that after innumerable inventions, the escapement which is found to be the best adapted to the pendulum and the most suitable to interfere as little as possible with the natural uniform vibration of the balance is the escapement invented by George Graham in the early part of the eighteenth century. This escapement has been the constant theme of discussion among the most eminent chronometer makers for one hundred years, and a furious paper war respecting its merits raged in 1750 between the Paris Academy of Sciences, the Royal Society of London, and the principal clockmakers of that period of France and England. A lucid description of the construction of this escapement, by Graham's head workman, Thomas Skelton, will be found in the *Gentleman's Magazine* for March 1752. The illustration on the next page shows the Graham escapement on the system of Mr. Charles Frodsham.

The diameter of the escape-wheel is $2\frac{1}{4}$ inches, and the pallets embrace 9 teeth or $8\frac{1}{2}$ spaces. The most important point in the escapement is the distance of centres of the escape-wheel and pallet axis.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

This escapement possesses such great interest that it is considered desirable to annex an illustration of it, with the view of endeavouring to settle the long-vexed question with regard to the best form of this important movement. Notwithstanding the evident merits of this escapement, it has been one of the most fertile subjects of argument among chronometer and clock makers during the last three international exhibitions. The parties may be said to be divided

THE GRAHAM ESCAPEMENT ON THE SYSTEM OF MR. CHARLES FRODSHAM.



T. The tangent circle which determines the slopes and angular value of the pallet faces A B.

into two—the one advocating the remontoir and gravity escapement, the other the Graham dead-beat escapement; but the latter party, though agreed on the general principles, are greatly at issue on the details of construction. The principal difference consists in the number of teeth of the escape-wheel embraced by the anchor or pallets. The fewer the number of teeth embraced the shorter will be the arm of repose, and the

friction will necessarily be reduced to that ratio; but this subject of friction has been found to be a fallacy, for when the friction is reduced on the pallet rest it is increased on the angle of impulse. The friction has been found, moreover, to be of no detrimental importance; as a rule, it is equal to the sum of all other friction, and therefore admirably adapted to maintain a uniform vibration of the pendulum. The length of the pallet arms is the natural tangent to the semi-angle of the middle of the pallet pad; therefore the greater the number of teeth embraced in the anchor pallet the longer will be these arms.

Thus, if we were to embrace 12 teeth the length of the pallet arms would be as 5 to 26. A medium course has been adopted. Vulliamy embraced eight teeth. This number has many properties to make it a standard number, inasmuch as the length of the pallet arm is the radius of the escape-wheel; and that most important point in the construction of the escapement, the distance between the escape-wheel and the verge axes is the sum of the square of the radius—viz., 1.4142; and the chord of the angular opening of the pallets is equal to this distance—viz., 1.4142; but chronometer makers have preferred embracing larger numbers, as nine and ten. These are decidedly the best mean numbers to use, both in the construction of the highest and plainest work.

Under the head of first-class clocks for domestic use, those manufactured by English makers are the best. France, however, also exhibits excellent specimens. The clocks of A. Brocot (France, 81) are especially to be commended for their escapement pallets. The system adopted by this maker is called the pin-pallet escapement. It can be constructed with the smallest amount of drop, and is equally valuable for a highly-finished clock as it is for an economical one, or for clocks of small price. P. Drocourt (France, 99) exhibits numerous domestic clocks of great elegance and moderate price.

House
clocks.

Austria, Wirtemberg, Hesse, and the Black Forest are all admirably represented by good clocks, which display excellent workmanship, especially when considered in connexion with their prices.

The show of turret clocks is extremely limited; the most remarkable are those by J. W. Benson (United Kingdom, 4) and Gaurdin (France, not in catalogue). The latter exhibits a large clock made for Buffalo, United States. Chimes of 43 bells, with machinery by which the airs may be varied, are attached to this clock; these have been made by Bollee and Sons, of Mans, and are remarkable for their sweet tones.

Turret
clocks.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

L. C. Detouche, Paul Garnier, A. P. Borrel (France, 26, 28, and 34), and S. Fournier (United States, 3) also exhibit turret clocks. None involve any very novel construction; in all, however, the workmanship is extremely good. This applies especially to Fournier's clock, which is a most carefully constructed instrument. The paucity of turret clocks in the present Exhibition is the more remarkable as the French were extremely distinguished formerly for the manufacture of these timekeepers. The celebrated clock at the General Post Office in Paris, made by La Paute, is said to have cost 3,500*l.*, and is highly remarkable for its excellent mechanism.

Nearly all the turret clocks exhibited by France possess the remontoir and gravity escapement, and are of extremely complicated construction. It is also worthy of notice that while in England pendulums are generally used for turret clocks of 6 ft., 8 ft., and 14 ft. in length, with cylindrical bobs weighing from 100 lbs. to 500 lbs., the French seem in their pendulums rarely to exceed the second's length, and the average weight of the bob is not over 40 lbs. It may be also mentioned that the external dials are not of the large dimensions used in England; they are, however, as a rule, extremely neat.

Electric
clocks.

Electric clocks are not so numerous in the present Exhibition as might be expected from the excellence to which they have attained. The application of electricity to time has, however, several representatives. The clock exhibited by Paul Garnier (France, 28) is one of the best, combining various improvements. They may be thus enumerated:—The oscillations of the pendulum are independent of, and free of any influence from, the moving power (whether electricity or gravity). The pendulum is compensated. The rod, of white deal, is baked and soaked in a mixture of beeswax, oil of turpentine, and linseed oil, and then French polished, to prevent absorption of moisture. The compensation consists of a zinc tube (sheet zinc), resting on the adjusting nut at the bottom of the wood rod; the cast-iron bob rests on the top of the zinc tube by means of a plate screwed to the latter. The proportions are as follow:—The acting weight suspended from the curved lever, for the purpose of uplifting the impulse arms, is $2\frac{1}{2}$ drachms, exerting a pulling pressure (longitudinally) of about $\frac{1}{2}$ drachm at the point where the arms hold the curved lever, so that the actual force required to disengage the arms is a high fraction of a drachm, the hooks of the curved lever and the pin in the impulse arms being hardened and polished cast steel. Hence the pendulum becomes a correct timekeeper,

equal frequently, when due care is taken, to a first-rate astronomical clock. In the best form of electric clock the pendulum makes a contact at each oscillation by bending a spring, which in itself, as the temperature varies, will influence the rate of the clock. The manner in which the impulse is imparted to the pendulum is not entirely free from friction, and tends to produce "wobbling," as the impulse, although parallel, is not in the same plane as that in which the pendulum oscillates. The contact-makers are generally formed of iron cups containing mercury, into which dip pieces of copper with iron extremities. One enters the mercury at the moment the other leaves it, so that no spark from the direct current can oxydize the surfaces of the contact-makers, as both transmit the same current alternately—the left one to the magnet of the pendulum, the right one to the clock.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Attempts are being made by the French to introduce clocks constructed at Dieppe by machinery. They are in all respects greatly inferior to those made in other parts of France, and if their introduction be general, they will tend greatly to lower the character of French domestic clocks. As a rule, the result of attempting to manufacture clocks and watches by machinery in a plain way is soon to fall into a slovenly method, and thus to discourage good workmen. If the pride of highly-finished work is destroyed, first-rate hands can rarely be retained. The jurors of class 23 were greatly disappointed by the working parts of French clocks which had been constructed by machinery. They are far inferior to the work turned out in the villages of Lancashire, where the fabrication of our horological movements is carried on.

Machine-
made clocks.

Very ingeniously constructed small, portable alarum clocks are exhibited by T. Philippe (France, 52); they strike an alarm and light a candle. Their price is extremely moderate. A Knespach (Austria, 9) exhibits a collection of excellent domestic clocks, the prices of which are also very low.

Alarm
clocks.

POCKET CHRONOMETERS AND WATCHES.

No section of horology shows greater advance since the Exhibition of 1851 than that of pocket chronometers and watches. The most striking feature is an improved proportion of all the works; but the two most essential points of improvement are the increased weights and diameters of the balances, the importance of which in the construction of a pocket watch is now fully established. Although France makes a larger exhibition of watches than England, those

Pocket chro-
nometers
and watches.

MR. WALLIS
ON
BRONZES,
&C.
—

is from a model by Molen, of Stockholm, and is the production of the foundry of Messrs. Leng Brothers and Herold, of Nuremberg. It is well executed and finished, and has been cast in one piece, except two arms, which are "fired on."

Nicholas
Simon.

Animals
cast in iron
and treated
with colour-
ing material.

One of the most curious and original exhibits of works in cast iron is to be found in the Bavarian section (1). Nicholas Simon, sculptor, of Munich, contributes a stag, a roebuck, and a chamois, modelled by him of the size of life, and cast in iron, which he has afterwards treated with coloured material, sand, &c., inserting glass eyes, and giving them a singularly close appearance to specimens of the art of taxidermy. Of course, on close examination, this appearance is modified by a certain rigidity in the details. At a short distance the texture, however, is cleverly imitated. As metal castings these works are good. The stag was cast by Messrs. Gienauth Brothers, of Eisenberg; the roebuck and chamois at the Royal Foundry of Obereschstædt.

Indissoluble
plaster for
models in
cast iron.

M. Simon claims to have discovered an indissoluble plaster with which he can build up his model in the manner of clay and then use this model, when finished, for the purpose of moulding direct for the iron casting, as this plaster forms a concrete which is not affected by the wet or "green" sand.

There are two or three examples of the application of this method of production exhibited in the furniture department of the Bavarian section (class 14). They are stags' heads, tinted as above described, and mounted as decorations for entrance-halls, &c.

AUSTRIA.

AUSTRIA.

The Impe-
rial Foundry
at Vienna.

The art bronzes of Austria are confined to those exhibited in the Fine Arts Gallery, and are the production of the Imperial Art Foundry at Vienna. As examples of artistic metal casting and chasing, they are of a high class. The treatment is essentially metallic and approaches, in some particulars, to hardness in the rigid care with which the details are carried out. The surface is treated as a "mat," and the bronze is uncoloured. There is no affectation of burnish or variation of surface of any kind. The result is a sculpturesque effect of the purest character. The largest works are four busts, lifesize, of eminent statesmen and ministers of the Emperor of Austria—Schmerling, Viszanik, L. Epstein, and C. Eral. These are all modelled by the sculptor, C. A. de Fernknor. The other works are four equestrian statuettes, treated with great skill and admirably chased and finished, by the same artist. The subjects are Baron Jelacic, St. George overcoming the Dragon, Arch-

Bronze busts
and statu-
ettes.

duke Charles of Austria, and Prince Eugène of Savoy. They are of small dimensions, and mostly reductions from larger works. Fernknor also exhibits a bronze model of a colossal fountain for the Bourse at Vienna, but it is not a work of any special interest.

MR. WALLIS
ON
BRONZES,
&c.
—

The contrast of treatment between these small bronzes and those of the French is very great. Undoubtedly the French gain in *technique* by the comparison, if they lose in true art-quality.

The commercial bronzes of Austria are chiefly small works of a fanciful character, consisting of conceits composed of the accoutrements of the chase, dogs, animals killed in hunting, machines and machinery, emblems of art and science, some of which appeared first in the International Exhibition of 1862. The principal exhibitors of these objects are Dzifdzinski and Hanusch, Louis Boehm, Theodore Klein, Auguste Klein and Clement Lux, all of Vienna. The details of these works are finished with great care and precision, and present features of art-workmanship not paralleled in this class of exhibits. They are either gilt or silvered, the silver being mostly oxydised to a grey black. The effect of these latter works is very pleasing, especially in those groups in which machines, or the details of machinery, form a principal feature.

Commercial
bronzes.

The specimens exhibited by Dzifdzinski and Hanusch (7) are the most remarkable for size and variety of subject, as also in having less of the merely fanciful in design in their composition as art-works. A toilet mirror and pair of candelabra en suite are especially elegant and novel. The enamelled work inserted in ormoulu, round the mirror frame, is a happy and artistic relief to the whole. There are two copies of this design—one silvered and oxydised, and the other in ormoulu; but the former is the most artistic in effect.

Dzifdzinski
& Hanusch.
Objects in
bronze,
silvered and
oxydised.

SPAIN.

DAMASCENE-WORK.

SPAIN.

There are no bronzes in the Spanish section; but the very excellent specimens of damascene-work exhibited by Zuloaga and Sons, of Madrid, more than compensate for their absence.

Damascene
work.
Zuloaga &
Sons.

These examples of the modern skill of the successors of the Moorish metal-workers of a past age are the most notable objects of their class in the Exhibition. The cover of a portfolio, divided into panels of open work, chiselled with the most exquisite skill, the whole being chased in the most delicate relief, is a triumph of metallic art. The damascene-work proper, forms the ornamentation of the inside. A double

MR. WALLIS
ON
BRONZES,
&c.

Shields,
vases, &c. in
Damascene
work.

inkstand and writing-case, united in one design, is treated *en suite* with the portfolio-cover, the latter, in fact, being an appendage to the former, but is the most original work of the two. A pair of vases and four shields, all of damascene-work, of the most elaborate character in design and excellence of execution, form the remaining portion of Zuloaga and Sons' small but very remarkable exhibit, which is certainly unique of its kind, and deserves special and careful examination by all interested in the production of artistic metal-work of the highest class. Illustrations or lengthy descriptions are quite inadequate to do practical justice to the real character of such works. They are, somewhat singularly, placed in Class 36, Jewellery, &c. (40).

DENMARK
and SWE-
DEN.

DENMARK.—SWEDEN.

None of the objects exhibited by these countries in Class 22 are properly placed, but belong to Class 21; or, as specimens of electro-metallurgy, to Class 40.

RUSSIA.

Fine Art
bronzes.

The bronzes exhibited in the Russian section of the gallery of the Fine Arts by N. Lieberich present features so very different to those which characterise the French examples, as to almost suggest that they are produced in another material and by a totally different process. The works are eminently worthy of study, especially by the young modeller for metal-work. Not that every point is worthy of imitation, but as showing the result of a painstaking and conscientious study of nature in combination with accurate artistic perception, and a thorough knowledge of the conditions on which the subjects of study were to be reproduced in metal.

Lieberich,
groups in
bronze:

As specimens of moulding and casting they are unique. There is no merely conventional treatment in the chasing, which has been strictly subordinated to completing the idea of the original modeller, and nothing more; a most important point to be borne in mind, in what should ever be considered as a supplementary process. The most elaborate group is that representing the Emperor Alexander II. saving the life of a hunter in a bear-hunt. The principal figure, that of the Emperor, is about 20 in. to 22 in. in height. The treatment of the whole subject is most elaborate, and is, of course, more picturesque than sculptural. Another notable subject is a bear seated on his hind quarters awaiting the attack of a hunter. This and the bronze representing a hunter in the clutches of a bear which he has stabbed in the belly with a hunting-knife, are very ably executed works. These three works, as also most of the others, are by

Aubepuxb. The most instructive among the smaller examples, and certainly the most careful and artistic study, is that of a dead stag laid upon a rush mat. The drawing, modelling, and chasing are excellent, and worthy of careful examination.

MR. WALLIS
ON
BRONZES,
&c.

Several of the works were exhibited in the International Exhibition of 1862; as, for instance, the group of the Laplander driving four reindeer—a work of great spirit, and skilfully carried out.

BRONZES
to exhibit
specimens
of art

There are a few well-executed and characteristic works in bronze, &c. exhibited as specimens of manufacture, and occupying a portion of a court in the Russian section devoted to other industrial productions. Amongst these is a very interesting series of sixty-six small busts, in bronze, of the Sovereigns of Russia. They are reductions from the originals in marble and bronze, executed as a part of the decorations of a chapel commemorative of the event of the 4th of April, 1866—the escape of the Emperor of Russia from assassination. As a series, they possess historical value, and as works of art many of them are good. The casting and chasing, as well as the general style of finish, are skilfully managed. This series is exhibited by Felix Chopin, St. Petersburg. (1).

Commercial
and de-
corative
bronzes.

Busts of the
Sovereigns
of Russia.

Alexander Sokoloff (4) exhibits a few small bronzes of animals of a similar character to those of Lieberich in the Fine Art Gallery. An elaborately wrought portrait of the Emperor of Russia, in bronze repoussé, is also exhibited by Sokoloff, and is a work of considerable skill. As a likeness, however, it is mechanical, and the elaborate ornamentation around may be studied rather as an example of what to avoid than for imitation.

Alexander
Sokoloff.

Portrait of
the Emperor
of Russia.

A pair of brass doors, exhibited by Messrs. Hencke and Pleske, of St. Petersburg (2), are admirable examples of casting, chasing, finish, and fitting. Some portions of the ornament are treated with great skill. It is no uncommon thing to see bad “fitting” accompanying excellent details in decorative metal-work of this class; but in these doors this important point is carried out with exceptional skill.

Hencke &
Pleske.
Brass
doors.

Another illustration of Russian brasswork is a pair of candelabra exhibited by Nicholas Stange (5). There is a refreshing originality in the arrangement of the parts of the objects, and the ornamental accessories almost justify the somewhat hypothetical phrase of the catalogue, “dans le style Russe.” These specimens are models, probably on a reduced scale, of those executed for the Protestant church of St. Peter and St. Paul at St. Petersburg. A bronze medal of the exterior of this church is also exhibited by Stange. The ornamental details of the principal façade are executed

Nicholas
Stange.
Decorative
brass
work.

Bronze
model of a
church.

MR. WALLIS
ON
BRONZES,
&C.

with great taste and skill, and the whole work is finished with scrupulous care, every detail being carried out most conscientiously. This model is very suggestive in many points, as it is an enduring record, in a most pleasing and artistic form, of the features of the edifice it represents.

ITALY.

Reproduc-
tions of
antique
bronzes.

ITALY.

The Italian bronzes are chiefly reproductions either of full size or on a reduced scale of antique works. The skill shown in most of them is very great; in fact perilously so for purchasers travelling in Italy. The fractures, patina, stains, dints, and other damages incidental to disinterred objects of bronze art, are so skilfully reproduced, especially in the smaller and more portable examples, as to render some considerable insight into the "art and mystery" of the manufacture of old things from new materials indispensable before giving a judgment or making a purchase. One can, therefore, excuse the pertinacity with which an amateur who has seen an antique (?) bronze discovered in some classic spot, and dug up in his presence, adheres to his opinion that it is genuine in every particular.

It would be quite useless to note special examples of this *integrity* of reproduction, as nothing but a careful personal examination will be of the least value in forewarning collectors as to the only truth about the works—the truth of imitation.

Reproduc-
tions of
bronzes
from Her-
culaneum.

In the larger reproductions there is less elaboration of the incidental details of forged antiques, but the skill of imitation is none the less evident on that account. In the avenue of the fine art gallery are two specimens; one is a Mercury, in bronze, seated upon a rock carved in grey marble; the other is a Discobolus, with eyes inserted, in marble mosaic. Both are from originals found in the excavations at Herculaneum. The Mercury is wonderfully sharp in the details of the casting and finish. The wings attached to the feet of the Mercury might have been wrought by the hands of a chaser of to-day, except that the work is thoroughly antique in character.

The drunk-
en and
sleeping
fauns.

In the Italian annexe, in the park, placed with the pottery, there are bronze statues, the size of life, of two Fauns; both have rock bases carved in variegated grey marble. One is a drunken Faun stretched backwards upon a half-empty wine-skin, snapping his fingers upwards in the revelry of intoxication. The rock is covered with a panther-skin cast in bronze, but so arranged that it spreads thinly over the inequalities of the rock. The head, legs, paws, and tail are thus arranged as adjuncts, in metal, to the figure; and the skill shown in

casting renders the work, even as a reproduction, an admirable illustration of antique treatment in metal. The other is a sleeping Faun; and, although equally good in casting, &c., it has not the same interest as the first named.

MR. WALLIS
ON
BRONZES,
&c.
—

A reproduction, in bronze, of the colossal marble statue of "David" by Michael Angelo, in front of the Pallazzo Vecchio, Florence, is exhibited by Clement Papi, of Florence (5), and is placed in the fine art gallery. It is a good casting, well finished, and looks better in metal than one could have anticipated from the rounded, although strong, markings of the muscles. This reproduction of works in marble by casting in bronze seems to be adopted by the French, as already noted, to a greater extent than is always satisfactory; for a work adapted in its finish to marble, is rarely, if ever, equally well adapted to metal.

The statue
of David,
by Michael
Angelo.
Reproduc-
tion in
bronze.

The peculiarity of the larger examples of the Italian bronzes, above named, is the remarkable absence of any appearance of an artificial system of colouring the metal. Of course, this is simply an appearance, as in reality they are most carefully treated; but then this is done with great skill, and is evidently not the result of any sudden or violent chemical action. In short, the object of the Italian mode of treatment is to give as nearly as may be the tone and tint which time gives, and not a special colouring as part of the artistic effect to be produced, which is essentially the French system, tint being an element of finish.

Colouring
in imitation
of the
antique.

The modern Italian bronzes exhibited in the fine-arts section are a statue of "Cain" and a statuette of "Esmeralda." The former is of full size, and is from the Marini Foundry, at Florence. It partakes largely of the antique manner of treatment, but in parts is affectedly rude, yet always intelligent. The casting appears "rotten" at some points. The group of "Esmeralda," with the goat, tambourine, &c., is by T. Solaré. As an example of casting, it is good: but the modelling and chasing are mechanical, like the modelling and finish of most of the Italian marbles.

Modern
Italian
bronzes.

There are two or three busts and a reproduction of an antique candelabrum, which do not present any features requiring other mention than that already given as illustrating the peculiarities and special points of the Italian bronzes; whilst the commercial bronzes, apart from the antique reproductions, are small and insignificant.

UNITED STATES OF AMERICA.

The remarkable skill in iron-casting evidenced by the productions of the leading founders of New England, on which I had the honour to report in 1853, at the period of the

UNITED
STATES of
AMERICA.
Progress in
casting
Fine Art
works.

MR. WALLIS
ON
BRONZES,
&C.

International Exhibition at New York, has culminated, as was to be expected, in the production of some admirable bronzes, now that the growing art-power of the country has been educated to the production of really artistic models. This was the defective point fourteen years ago, as comparatively few of the statues of public men executed in bronze or iron in the cities of the United States had any claim to be considered works of art, yet, as specimens of skill in casting, they bore evidence of great ingenuity and a thorough mastery over method and material.

The art-bronzes exhibited in the fine-arts gallery are all of more than average excellence as works of art; whilst, as castings and specimens of skill in chasing and finish, they are equal to the best European works.

M. J. Q. A.
Ward.

Bronze of
the Indian
hunter.

"The Indian Hunter and his Dog," by M. J. Q. A. Ward, of New York, is a very successful sculpturesque treatment of a picturesque subject, thoroughly adapted to the material in which the work is executed, and with a full apprehension of the conditions requisite to successful casting in metal. The chasing, finish, and colour of the bronze are all excellent. In some of the details the work possesses the best art-qualities of the most perfect French bronzes. This group is the property of the Central Park, at New York, and is intended to be placed there on its return from the Exhibition.

The lib-
erated slave.

The same qualities, as regards casting and chasing, distinguish the statuette of "The Liberated Slave," also by Mr. Ward, except that in this work there is a decided imitation of the most artificial qualities of the French decorative bronzes.

Lamel
Thompson.
Bronze of
the Emperor
Napoleon I.

Mr. Lamel Thompson's able statue of Emperor Napoleon I. is another proof of American skill in the treatment of art-works in bronze. The modelling of this statue is severe, and with a thorough appreciation of the subject. Such a work by any Frenchman would have inevitably gained him great praise and honour. The variation of tint and texture, though obvious, is not carried too far, if it is allowable at all. On this point objections have been already stated when treating of the French bronzes. The treatment of the celebrated *redingote grise* of the Emperor contrasts in texture with other portions of the work in a most legitimate manner. The whole of the details are characterised by careful execution, and the chasing of the more highly-finished portions is especially skilful.

These American fine-art bronzes are worthy of careful examination and study, alike as regards treatment, finish, and colour.

In the industrial portion of the Exhibition (class 22) there is only one exhibitor in the United States section—Messrs. H. Tucker and Co., of New York—but this exhibit is certainly the greatest novelty in the treatment of metals in the Exhibition. It consists entirely of ornamental works in cast iron—gaseliers, lamps for paraffin, clocks, &c.—to the surface of which a bronze tint of a more than ordinary permanent character has been given by an entirely new process. As a matter of course the tint is not absolutely permanent, as by no artificial means, metallic or otherwise, can iron be so covered or coloured as to prevent final oxydisation. The process has been patented, and is based upon the fact that iron heated to a given temperature is oxydised, or becomes *blue*, which, as is well known, is the means of preventing further oxydisation by the atmosphere up to a certain point. Mr. H. Tucker, taking this fact in conjunction with another, that vegetable oil carbonises at precisely the same degree of heat, has succeeded in inventing a method for the production of a bronze tint on iron of a most satisfactory character, which tint finishes the work whilst it protects the objects from further oxydisation under any ordinary circumstances. The oil is laid very thinly upon the surface of the metal, the article is subjected to the proper heat, and when cool the operation is completed.

MR. WALLIS
ON
BRONZES,
&c.

H. Tucker
& Co.

Cast-iron
coloured in
imitation of
Bronze.

New pro-
cess.

As an illustration of the permanence of this surface finish and tint, I may state that the gaseliers exhibited were hung up in the Exhibition building early in March last. The roof above admitted water upon them, and they were frequently saturated with it, prior to the opening of the Exhibition. To this must be added the fact that the dust (chiefly lime-dust) covered nearly everything exposed in the building during this period; yet, on examination, no change can be discovered in the surface of the metal, whilst it is quite certain that, had works of a similar kind in bronze been subjected to the same exposure and treatment, the finish of the surface and colouring would have been greatly deteriorated, if, indeed, the bronze itself had not become oxydised.

Permanence
of the finish
and colour.

It has been supposed that this method of tinting is similar to that employed for colouring steel pens, but it is not so. Steel pens, whether yellow, blue, or bronze colour, are coloured entirely by heat alone; and I am assured that no ferruginous metal, except cast iron, will take the bronze tint obtained by the use of oil carbonised by heat upon a surface which will be oxydised blue at the same temperature.

Of the character of the works as castings it will be sufficient to say that they are first-class examples of American skill; and, although moulded in “green” sand, are equal to

Nature of
the castings
and charac-
ter of the
iron.

MR. WALLIS
ON
BRONZES,
&C.
—

any "dry" sand decorative iron castings in the Exhibition. This gives an enormous advantage to the manufacturer in point of economy of production.

The greater portion of the ornamental iron castings produced in the United States are manufactured of charcoal iron; but Messrs. Tucker prefer anthracite or coal iron for their castings, as it is found that coal iron takes the required bronze tint more perfectly and readily than charcoal iron, possibly from the greater affinity of the carbonised oil for the metal.

The iron used in casting the specimens exhibited is a mixture of Scotch (Coltness) and two or three kinds of American, as experience shows that the quality of metal thus obtained runs more freely, and produces sharper and more definite castings than even charcoal iron, which is often fallacious in appearance, indurated and brittle on the edges.

I have gone the more carefully into these details because I regard the process now illustrated by Messrs. Tucker as an important one in its application to several British industries.

GREAT BRI-
TAIN.

GREAT BRITAIN.

The main purpose of this report is to call attention to the best and most noteworthy productions of foreign countries for the information of British visitors, manufacturers, and others; it will therefore be sufficient to briefly glance at the few British exhibits in this class.

Thos.
Fowke.
Statuettes.

A very small display of bronzes is exhibited by Mr. Thos. Fowke, Park Lodge, Fulham, consisting of a few statuettes of figures in volunteer uniform. This constitutes the exhibits in the British section, in addition to a few well-known bronzes contributed by the Art Union of London, and the prize specimens of chasing included in the Society of Arts illustrations of the system of annual rewards to art-workmen, adopted by that institution.

Electro-
copper gates
for the
South
Kensington
Museum.

As a substitute for bronze, the doors for the South Kensington Museum may be quoted. These are executed by the electro-deposit process from the general design by the late Mr. Godfrey Sykes, the models having been produced, after his death, by his assistants, Mr. John Gamble and Mr. Reuben Townroe. This work is eminently architectonic, and is of value, as showing the extent to which the electro-galvanic process can be employed in the production of large and important objects of this class, and in the direct production of the artist's own work, without the introduction of those mechanical methods which involve the action of other minds and hands, to the deterioration of the original thought as expressed by the designer and modeller. In these doors

the entire spirit of the models has been kept in its integrity, by the process not necessitating any mechanical finishing in the metal. Doubtless such a process is a somewhat crucial test of the powers of the modeller; but in any case the beauties of a work are preserved intact, whilst the faults are not added to by the superfluous manipulation of the chaser in an attempt to finish details which the artist himself had no desire should be carried beyond the point which he thought necessary to the expression of his idea in the original model.

MR. WALLIS
ON
BRONZES,
&C.
—

Messrs. Elkington and Co. exhibit a large work in steel repoussé—the Elcho challenge shield—designed by Mr. G. J. Cayley. It is a notable example of considerable size, and is executed with great skill and precision. As an illustration of what can be done in steel by this method of ornamentation it deserves careful study and close examination. This work is a presentation from Lord Elcho to the volunteers of Great Britain and Ireland as a challenge prize.

Elkington
and Co.
Steel re-
poussé
shield.

As an example of iron-casting, a case for hot-water pipes, executed by Messrs. H. Hoole and Co., Sheffield (2), after a design by Mr. Alfred Stevens, for the South Kensington Museum, is to be noted for the admirable manner in which the work has been adapted to its purpose, and the decorative result produced by the repetition of a few well-considered but simple ornamental details.

H. Hoole &
Co.
Case for hot-
water pipes
in cast iron.

Another work in iron of a very different character, being altogether of wrought metal with repoussé decorations, is a pair of gates for a garden approach or terrace, executed and exhibited (Class 40, No. 4A) by Messrs. Barnard, Bishop, and Barnards, Norwich. The object has been, whilst following certain traditionary methods of execution, to produce a work without reference to any special style or precedent. Avoiding symbolism, a distinct reference to nature has been made for the ornamental details, and a design worked out, as a whole, which, whilst pleasing in its general effect, bears the impress of handicraft power dealing with a material which in modern times it has been the fashion to consider so unyielding in its character, that to bring it into a decorative form at all suited to modern wants and ideas it must of necessity be manipulated in the foundry rather than the smithy, and the art-forms moulded from a fixed model and cast into form from the crucible of the ironfounder, rather than emanate direct from the hands and brain of the cunning artificer, guided by the art-experience of the educated ornamentalist. Happily, however, file, nippers, shears, punch, and chisel have not been altogether superseded by model, matrix, stamp, die, and chasing tool. Thus, in this Inter-

Barnard,
Bishop, &
Barnards.
Wrought-
iron garden
or terrace
gates.

MR. WALLIS
ON
BRONZES,
&c.

Nature of
the design.

national Exhibition we see to-day efforts to bring back the handicraft power of the past, not so much to supersede the mechanical appliances of more recent times, but to supplement them; especially in works which are not required to be reproduced in numbers for the markets of the world.

It is not necessary here to go into descriptive details, which would occupy too much space and be of little or no practical value. The aim of the producers has been a high one; and if they have not achieved all that the designer aspired to, enough has been done to show how much may be effected by a clear and distinct perception of nature in its decorative character, of material in its adaptation to certain well-considered ends by traditionary means, and of handicraft power educated sufficiently in the elementary principles of art to work out intelligently, and with skill and tact, the thought of the artist.

The repoussé panels which are inserted into the upper and lower parts of the gates are notable for the breadth with which the various subjects upon them are treated. Foliage and blossoms, birds and butterflies, offer temptation to details which would have been very much out of place; yet the temptation has been resisted, and the artist-smith has preferred intelligent breadth to unintelligent minutiae—in short, power to weakness.

Treatment
of the de-
tails.

The treatment of the scrollwork and details of the American thorn, which forms the leading type in the foliated portions, is deserving of careful examination by workers and designers in this direction; and the same remark applies to the specimens of ornamental wrought-iron work exhibited by Messrs. Barnard, Bishop, and Barnards, in the architectural court.

The Skid-
more Manu-
facturing
Company.

The gable
frontal for
the Prince
Consort's
memorial.

The only remaining work of importance to which it seems desirable to call attention is this report is one of the gable frontals of the canopy to be placed below the *flèche* of the memorial to the Prince Consort, now erecting in Hyde Park, after designs by Mr. Gilbert Scott, R.A. This is a large and important specimen of wrought work in metal, and has been executed by Skidmore's Art-Manufactures Company, Coventry, by whom it is exhibited (3).

Novelty of
arrange-
ment of the
parts and
the effect.

As this work is a novelty in the construction and combination of metals and other materials, it is desirable to give such details as may make its peculiarities intelligible. It is one of four frontals, forming the principal features of the canopy, to be placed at a height of 75 ft. from the base. The angle-pieces forming the framework are of iron; and, to protect a material so liable to oxydisation from the action of the atmosphere, the surfaces are all covered with lead of

about one quarter of an inch in thickness at the thinnest parts. Into this covering of lead jewelled details are inserted and firmly fixed by hammering up the pliable, but, so far as weather is concerned, durable metal. These jewelled details consist of various coloured marbles and granites, with crystals, onyx, agate, opal, jasper, cornelian, and other hard polished stones. To these are added, at suitable points, enamelled masses of different tints, giving variety and harmony to the colouring. The lead is left in its natural colour to form a background, so to speak, at certain points; at others it is richly double-gilt. The ridge decoration is of repoussé copper, and is highly ornamental. This, being also left in its natural colour, harmonises admirably with the polychromatic and gilt effects above named.

MR. WALLIS
ON
BRONZES,
&c.
—

The style of work is a revival in the manner of the jewelled work of the thirteenth century, such as may be seen in the shrines of the cathedrals at Aix-la-Chapelle, Cologne, Tournay, and other places, with this important difference—that here we have an architectural work executed the full size required by the exigencies of the structure, and for erection in the open air; whilst the works of the Middle Ages were either reproductions, on a small scale, by the metal-workers and jewellers of the time, of edifices which had been erected, or in a similar style of art to such edifices, the design and detail being adapted by the handicraftsman to the more precious materials in which he was called upon to work.

Style of the
work.

Large as the work appears in its present position, yet when seen fixed at the height of 75 ft. from the surbase of the monument, the effect will be that which has been so distinctly aimed at—that of the jewelled work of the best period of mediæval art.

Size, &c.

CONCLUSION.

In concluding this report, I may be permitted to state that, as far as possible, every section of the class of objects included in the arrangement adopted by the French executive as belonging to class 22, of which there are examples in the Exhibition, has been examined and noticed, so far as I deemed them of practical value to the artist, the manufacturer, or the artisan. The objects specifically described appeared to me to possess points of special interest likely to be valuable to those engaged in the same or in kindred industries, or to present features which it seemed desirable to record among the achievements of art, science, and manufacture in their relation to each other. In this respect the object I have sought to accomplish has been to make this

Conclusion

The report
a lesson and
a record.

MR. WALLIS
ON
BRONZES,
&c.

report at once a lesson and a record—a lesson, so far as my experience and knowledge of art, as applied to manufacture, would enable me to apply the principles and practice accepted as the foundation of success in the great works of past ages, and even of the present time; and a record of such novel features as appear likely to influence the future, whilst indicating the progress of the past twenty years by the facts derived from personal experience and observation, the result of opportunities of a somewhat exceptional character, but which rendered the task undertaken so much the more difficult to fulfil to my own satisfaction.

REPORT ON HOROLOGICAL INSTRUMENTS.—(Class 23.)—
By C. R. WELD, Esq.

MR. WELD
ON HOB-
LOGICAL IN-
STRUMENTS.

BEFORE entering on the more immediate subject of this report, it will be desirable and instructive to compare the number of exhibitors of horological instruments at the Paris Exhibition of 1867 with the number who exhibited at the International Exhibition of 1862, classed according to their respective countries. They are as follows:—

In 1862, 300—namely, Austria, 10; Baden, 26; Bavaria, 1; Belgium, 1; Brazil, 1; Denmark, 5; France, 54; Hanse Towns, 3; Holland, 1; Italy, 4; Mecklenburg, 1; Norway, 3; Prussia, 6; Russia, 1; Saxony, 4; Spain, 2; Sweden, 5; Switzerland, 72; United Kingdom, 97; Wirtemberg, 3.

Number of
exhibitors.

In 1867, 535—namely, Austria, 28; Baden, 25; Bavaria, 4; Belgium, 6; Denmark, 6; France, 223; Greece, 1; Hesse, 1; Holland, 1; Italy, 10; Portugal, 1; Prussia, 14; Russia, 5; Spain, 1; Sweden, 2; Switzerland, 163; Turkey, 7; United Kingdom, 29; United States, 3; Wirtemberg, 5.

Thus it will be seen that there is an increase of 235 exhibitors in the horological class over those who exhibited in 1862; and it is also worthy of remark that not only are the exhibitors in the present exhibition more numerous, but also that the exhibitors generally have made a larger display of horological objects than were shown in 1862.

Among the numerous remarkable mechanical inventions which challenge our admiration in the great Paris Exhibition, not one can be regarded as more useful than that by which the passage of time is accurately registered. From the period when timekeepers in the form of the quaint “Nuremberg eggs” were invented, it has been the constant endeavour of horologists to improve the construction of horological instruments, and the efforts in this direction have been so successful that ships in the middle of vast oceans are enabled by means of chronometers to ascertain their position with extraordinary precision, and parties in dense forests provided with these instruments cut paths through the wilderness with unerring accuracy. To the marvellous precision of chronometers the laying of submarine telegraph cables is in a great measure due, and without their aid the picking up of the lost Atlantic cable could not have been effected without considerable loss of time, if, indeed, it could have been found at all.

Value of
chronome-
ters.

The chronometer maker is undoubtedly a most important person, for the very lives of thousands of persons are committed, so to speak, to his keeping; and thus it is but

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

"Error of
compensa-
tion."

Effects of
tempera-
ture.

Auxiliary
compensa-
tion.

natural that he should do all in his power to perfect the valuable instrument which it is his business to construct.

The great mechanical problem to be solved by him is known as the error of compensation, and to this almost every chronometer maker of repute has devoted a large portion of his professional life. How serious are the errors of a chronometer uncompensated for temperature will be apparent by the fact that a chronometer well made in all respects, but not compensated, when rated at the Royal Observatory at Greenwich, showed that there was a uniform decrease of rate for equal increase of temperature, measured by a mercurial thermometer, amounting to 6.11 sec. in 24 hours for each degree of Fahrenheit, a mean temperature of 8 deg., causing a daily losing rate of 142.5 sec., and a mean temperature of 40.9 deg. a daily gaining rate of 225 sec. It has been well observed that the early chronometer makers must have been sadly disappointed and terribly perplexed when they found that their mechanical skill, often of a very high order of excellence, was thus marred by the effects of temperature. To the navigator these excessive temperature errors are most important, admonishing him that he should be very careful that his chronometers have been properly adjusted for low and high temperatures by skilful and trustworthy hands before going to sea. To this end all eminent chronometer makers keep an ice-chamber always prepared to receive chronometers, as well as gas ovens or stoves.

Mr. Airy, the Astronomer Royal of England, in his report to the Admiralty relating to the performance of chronometers, states that the prevalent cause of their errors is defective compensation, often aggravated by the use of bad oil. Strange as it may appear to many readers, oil is one of the greatest stumbling blocks in the path of the chronometer maker. A fine, even, and perfect lubricating oil is absolutely essential for his purposes. For good oil as high a price as 6*l.* a pint is frequently paid; but even at this price it is extremely difficult to obtain really good oil. The best is that made from olives, but, generally speaking, chronometer makers use animal oils.

To correct the temperature-error of chronometers has therefore always been the chief aim of the makers of these instruments, and an extraordinary amount of ingenuity has been shown in devising various modes of auxiliary compensation. Indeed, the International Exhibitions of 1851, 1855, and 1862 have almost teemed with inventions of this description; and that of the present year presents numerous examples of this nature. Most of these, however, are merely modifications of the auxiliary compensations contrived by

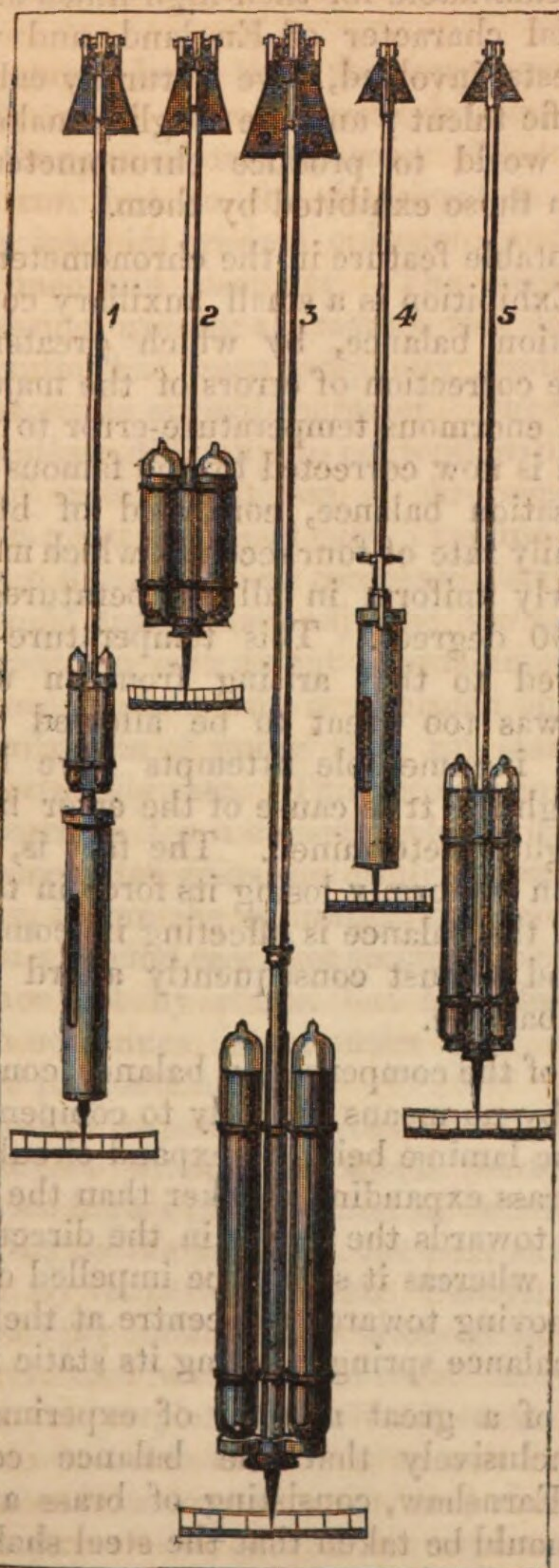
Mr. Charles Frodsham and Messrs. Molyneux, Eiffe, Ulrick, Pennington, and Arnold.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

MR. C. FRODSHAM'S NEW BRASS TUBULAR COMPENSATION PENDULUMS WITH
THE MERCURY HELD IN GLASS TUBES HERMETICALLY SEALED.

Astronomical
and clock

Common
ion balance



No. 1. Making 72 vibrations per minute, with central compensation jar and auxiliary compensation tubes.

No. 2. Making 100 vibrations per minute, with double mercurial tubes.

No. 3. Making 60 vibrations per minute, with double mercurial compensation tubes.

No. 4. Making 80 vibrations per minute, with single mercurial compensation tubes.

No. 5. Making 72 vibrations per minute, with double mercurial compensation tubes.

Approximate scale, one-tenth.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Astronomi-
cal clocks.

English chronometer makers have long stood at the head of their profession; and the astronomical clocks and marine chronometers exhibited by them in the Paris Exhibition are on the whole remarkable for their high finish and excellence. The commercial character of England, and the enormous shipping interests involved, have naturally called forth the highest scientific talent; and the English makers may safely challenge the world to produce chronometers of greater excellence than those exhibited by them.

Compensa-
tion balance.

The most notable feature in the chronometers exhibited in the present Exhibition is a small auxiliary compensation to the compensation balance, by which greater accuracy is obtained in the correction of errors of the major or principal balance. The enormous temperature-error to which allusion has been made is now corrected by the famous Arnold-Earnshaw compensation balance, composed of brass and steel laminæ, to a daily rate of four seconds, which may be regarded as pretty nearly uniform in all temperatures between 30 degrees and 90 degrees. This temperature-error, though trivial compared to that arising from an uncompensated chronometer, was too great to be allowed to remain uncorrected, and innumerable attempts have been made to adjust it, though the true cause of the error has never until lately been rightly determined. The fact is, that while the spring has been uniformly losing its force in the direction of a straight line, the balance is affecting its compensation by a curve line, and it must consequently afford an inadequate compensation balance.

The action of the compensation balance, composed, as it is, of laminæ, is by no means friendly to compensation, the inclination of the laminæ being to expand circularly; and it is only by the brass expanding quicker than the steel that the mass is driven towards the centre in the direction of a hypotenusal line; whereas it should be impelled down a parallel central line moving towards the centre at the same uniform speed as the balance spring is losing its static force.

The result of a great number of experiments has been to prove conclusively that the balance constructed by Arnold and Earnshaw, consisting of brass and steel, is the best. Care should be taken that the steel shall never exceed the ratio of two to five of the brass. Both these metals expand in heat and contract in cold, unequally, however, the ratio of the former to the latter being as nearly three to two. The chronometer should then be adjusted to temperature from 55 degrees to 90 degrees, and the error arising from extreme cold corrected by the use of a small auxiliary compensation. Mr. Charles Frodsham's compensation

balances, involving various new constructions, have been found to answer their purposes admirably. His micrometric balance affords a very simple means of adjustment without removing the balance from the chronometer or disturbing its mean time.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

It may be stated here that the very best chronometers, after from 15 to 20 years' service, become nearly useless under wide changes of temperature. This is not due to mechanical error, but to the deterioration of the balance spring, which loses its original cohesion, and hence has an impaired and uncertain elasticity. The slightest particle of rust on the spring greatly aggravates this decay. Happily, if the chronometer has been originally good, a new balance spring will restore its normal character. But the chronometer maker has another difficulty to contend with. This is the acceleration of rate. Suppose a chronometer has been completed with great skill and care, examined and corrected until it has been divested of all mechanical errors, and what is technically termed timed and adjusted for isochronism and temperature until the instrument is pronounced to be almost faultless; no sooner, however, is it placed on the register to ascertain its daily rate of going than up starts this error of acceleration on its daily rate. This acceleration, too, is found, as a rule, to increase for a considerable period. Thus, supposing the chronometer gains uniformly, when first rated, one second per day, before the expiration of a month it will gain daily, say, in an extreme case, five seconds; and this acceleration takes place not by starts, but by a daily gradual increase; and so continues for an entire year, or perhaps two, only in a lesser proportion.

Accelera-
tion of rate.

Various plausible arguments have been adduced to account for this acceleration—such as the works becoming more free, the surfaces more highly polished and in better working gear, the balance spring more elastic, &c., but none of these assertions are borne out by experience. Mr. Charles Frodsham, to whom we are deeply indebted for many great improvements in chronometers, and who has devoted much time to the examination of this perplexing problem, states that the cause of this acceleration is due in a great measure to the process of hardening the balance-spring by fire, during which the molecular particles of the spring are separated to a violent degree, though they are again partially restored in the tempering, and afterwards by continuous vibratory motion they gradually re-arrange themselves more closely, thereby gaining strength and occasioning a daily acceleration of rate.

English chronometers are, in general, constructed to go two days, or fifty-four hours, and to be wound up daily. A

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Mr. C. Frod-
sham's as-
tronomical
regulator.

considerable number, however, are constructed to go eight days, and are to be wound up every seventh day.

Amongst a great number and variety of excellent astronomical clocks, marine chronometers, and superior portable clocks, with chronometer escapements and compensation balances, exhibited in the Paris Exhibition, it is almost invidious to particularize names. The following makers of these instruments may, however, be cited as exhibiting work of the highest order of merit, Mr. Charles Frodsham (United Kingdom, 10*), who exhibits an astronomical regulator combining all accumulated improvements, including new brass tubular mercury compensation pendulum, and connecting galvanic apparatus for recording the time of observations. This clock, which has been made for the Cambridge Observatory, United States, is undoubtedly the most perfect instrument of its kind in the present Exhibition, and well deserves particular examination. It is a model of the celebrated clock (991) made by Mr. Frodsham for the Melbourne Observatory. The results of the performance of this clock during three years were submitted to the jury, and pronounced to be the most remarkable for accuracy on record. Mr. Frodsham attributes the wonderful precision of this clock not only to its mechanical excellence, but also to the discovery that few pendulum rods are ever so perfectly homogeneous as to lengthen directly by heat and shorten directly by cold. On the contrary, experiments show that they often expand into a bow form. In submitting six rods to a temperature of 600 degrees, only one of the rods remained perfectly straight, and the others bowed and warped into such shapes as to be entirely useless until they were re-annealed; and what was even more surprising was the fact that the flat rods not only warped more than the round ones, but also warped edgeways. This was a great discovery, and of the more consequence as it led to important improvements in the going rate of clocks. All pendulum experiments made for the purpose of ascertaining the cause of their variations must be viewed with but little confidence, unless the rods have undergone the test referred to, viz., submitting them to a temperature of at least as high as 600 degrees.

Brass tubu-
lar compen-
sation pen-
dulum.

In consequence of the great expense of compensation pendulums constructed with steel jars and rods, Mr. Charles Frodsham has substituted well selected brass tubes, carrying mercurial compensators hermetically sealed contained in a

* Mr. Charles Frodsham, who acted as juror on the part of the British Commission for the class of horology, was necessarily excluded from the competition for prizes.

central tube, or a number held in guides. The diagram on a previous page is an accurate representation of these new pendulums, which are adapted for clocks making the following vibrations per minute—60, 72, 80, 100, and 120.

The following valuable rules for the construction of the new brass tubular compensation pendulum have been recently drawn up by Mr. Frodsham. The mercury is held in one central glass jar, in a brass tube, for seconds and other lengths. The seconds' length is equal to 39.13 in. $\times$ half the height of the brass stirrup, whose outside length is 13 in. $\times$ 45.64 in., say 45.5 in. approximately. The sidereal seconds' length is 1.180 shorter than the mean-time length universally.

Pendulums are easily and quickly regulated by applying the following rule:—Note the error in seconds and the time in seconds in which the error occurred—say 10 sec. per hour. Then multiply twice the length of the pendulum by the error, and divide by the time—viz., 3,600 seconds.

Mr. Frodsham also exhibits a new brass tubular compensation pendulum and a galvanic apparatus applied to astronomical clocks, in connexion with chronographs for recording the precise time that observations are made.

Although classed under philosophical instruments, the isodynamic clock escapement, invented by Richard F. Bond, and used in connexion with his fine astronomical clock (United States, 4), deserves record here. Mr. Bond claims as the chief merit of his escapement that it overcomes entirely the difficulty arising from the varying power transmitted by the wheelwork, and that the slight friction, being constant, is wholly uninfluenced by the latter. He also states that the power may be increased to a hundred times the amount necessary to drive the clock, supposing the machinery capable of sustaining the weight, without in the least increasing the friction of the pendulum, or in any way interfering with the extent or time of its vibration.

Isodynamic
clock es-
capement.

Mr. Bond has further discovered that by a very simple addition he can secure a magnetic break-circuit entirely free from the danger of oxydisation, which will not in any way influence the pendulum or disadvantageously impede any other mechanism of the clock, hitherto the chief drawback to all break-circuits. This break-circuit has been in operation for a year without adjustment or alteration, and has not been found to fail in any one instance.

Messrs. Parkinson and Frodsham (United Kingdom, 22) exhibit chronometers with various good modifications of laminæ auxiliary compensation balances. J. Poole (23) and V. Kullberg (17) also exhibit excellent chronometers. Mr. M. F. Dent (9) shows a marine chronometer fitted with a

Mr. M. F.
Dent's
marine chro-
nometer.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

new auxiliary compensation balance. This chronometer is only the second which has been fitted with this kind of auxiliary compensation. This first was tried last year in the public competitive trials at the Greenwich Observatory. It stood fourth in the order of merit in the published official report of the Astronomer Royal, and was purchased by the Government, on his recommendation, at an honorary price.

Mr. Dent also exhibits a marine chronometer with a new kind of flat-rimmed balance, recently invented by himself. The principle of its mode of action is the same as that of Dent's staple balance, the compensating weights describing in their change of position a curved path in the plane of the axis of the balance approximating to a circular arc. Compared with the ordinary balance, the moment of inertia of this new balance will diminish more quickly as the temperature rises above, and will increase more slowly as it falls below, any given mean. Mr. Dent apprehends that another defect to which all balances are more or less liable will be mitigated—that is, the tendency which their compound laminæ have to “set” when exposed continuously for a considerable time to extremes of temperature, owing to their limits of elasticity being over-passed. This is expected to be mitigated by the form of the balance here exhibited permitting the laminæ to be made longer and thicker than usual.

France, which stands next to England in the excellence of astronomical clocks and marine chronometers, contributes several admirably constructed instruments. Those exhibited by L. Breguet (7), O. Dumas (2), A. Le Roy (63), B. Scharf (3), A. Jacob (6), A. H. Rodanel (8), and S. Vissière (29) are especially deserving of notice. The regulator exhibited by M. Breguet is remarkable for its new system of independent seconds and aluminium compensation pendulum.*

The Graham
escapement.

It is a remarkable fact that whilst a very large proportion of French exhibitors show an infinite variety of remontoir gravity escapements in connexion with astronomical clocks, all their energies seem to have been exclusively directed to this point, to the losing sight of the pendulum on which the uniformity of rate ultimately depends. Among the French astronomical clocks, all worthy of notice are constructed with the well-known Graham escapement, as well as with the mercurial compensation pendulum. There are also a few zinc pendulums of equal antiquity, the originals of which were invented as far back as 1773, by M. Rivaz, of Paris.† This

* M. Breguet, being a juror in the class of horological instruments, was excluded from the list of competitors for prizes.

† See Berthoud's “*Traité d'Horlogerie Marine*.”

pendulum was much used formerly by Breguet and Arnold. The latter employed it in one of the standard clocks for the Pulkowa Observatory in Russia, on account of the excessive cold in that climate occasionally freezing mercury.

It is worthy of remark that the beautiful and elaborate gridiron pendulums, of which the French made a splendid display at their Exhibition in 1855, are almost entirely absent on the present occasion. Grandjean and Co. (Switzerland, 25), exhibit the best Swiss chronometers; and A. Hohwu (Holland, 1) shows an excellent marine chronometer constructed on English movements, the auxiliary compensation balance being the check-piece of the celebrated English chronometer maker, Eiffe. M. Hohwu also exhibits a good astronomical clock, with Graham escapement and a mercurial compensation pendulum.

F. Tiede (Prussia, 11) exhibits a clock with electro-magnetic escapement, professing to go in vacuum. According to M. Tiede, the mean error of this clock, as determined during observations made for eighty-eight consecutive days—Nov. 9, 1866 to Feb. 5, 1867—was 0.038 sec. No trustworthy opinion could, however, be formed in the Exhibition of the performance of this clock, as the vacuum was found on trial to be imperfect, nor was the clock acting in accordance with the barometrical indications.

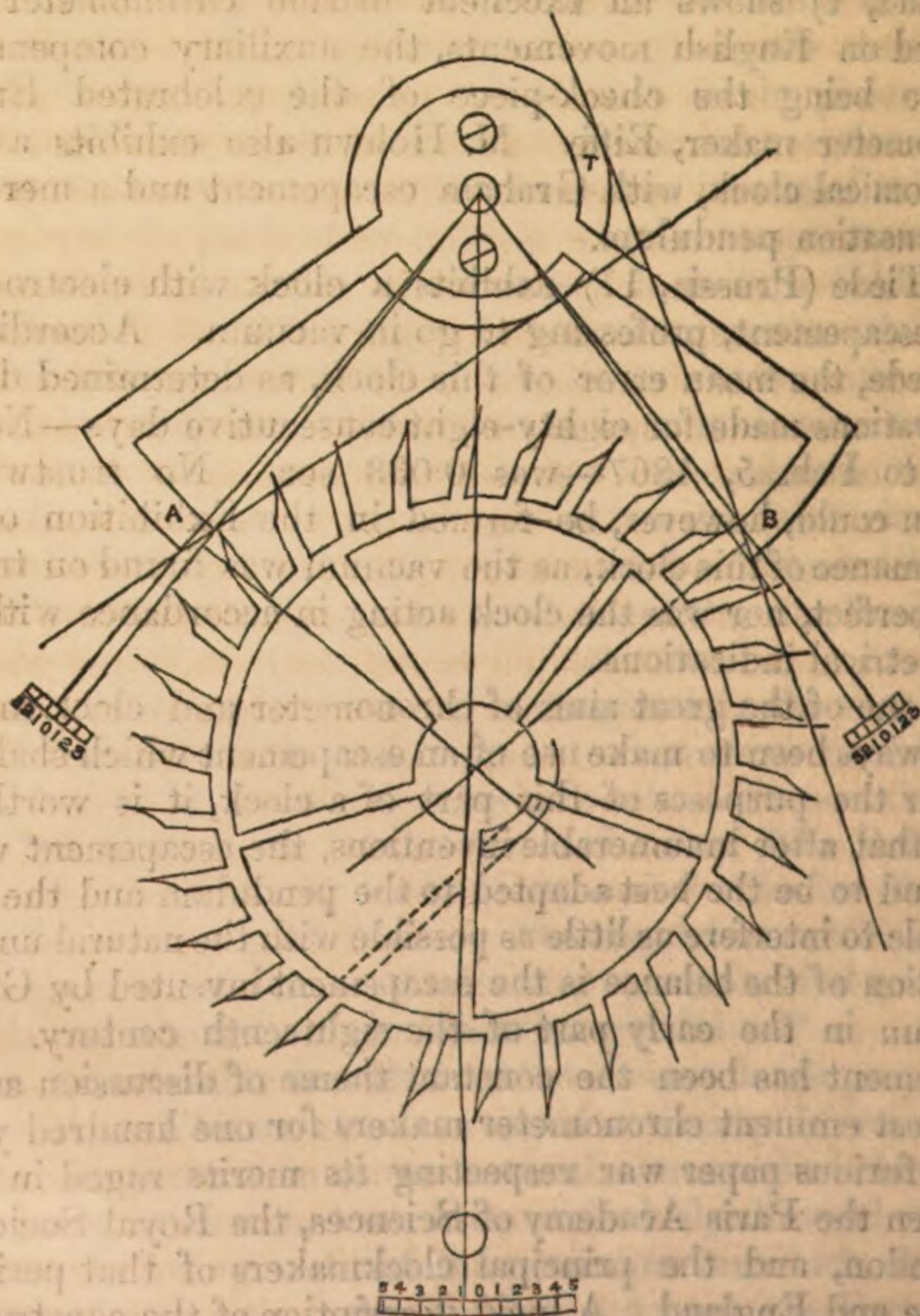
As one of the great aims of chronometer and clock makers has always been to make use of an escapement which shall best answer the purposes of this part of a clock, it is worthy of note, that after innumerable inventions, the escapement which is found to be the best adapted to the pendulum and the most suitable to interfere as little as possible with the natural uniform vibration of the balance is the escapement invented by George Graham in the early part of the eighteenth century. This escapement has been the constant theme of discussion among the most eminent chronometer makers for one hundred years, and a furious paper war respecting its merits raged in 1750 between the Paris Academy of Sciences, the Royal Society of London, and the principal clockmakers of that period of France and England. A lucid description of the construction of this escapement, by Graham's head workman, Thomas Skelton, will be found in the *Gentleman's Magazine* for March 1752. The illustration on the next page shows the Graham escapement on the system of Mr. Charles Frodsham.

The diameter of the escape-wheel is $2\frac{1}{4}$ inches, and the pallets embrace 9 teeth or $8\frac{1}{2}$ spaces. The most important point in the escapement is the distance of centres of the escape-wheel and pallet axis.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

This escapement possesses such great interest that it is considered desirable to annex an illustration of it, with the view of endeavouring to settle the long-vexed question with regard to the best form of this important movement. Notwithstanding the evident merits of this escapement, it has been one of the most fertile subjects of argument among chronometer and clock makers during the last three international exhibitions. The parties may be said to be divided

THE GRAHAM ESCAPEMENT ON THE SYSTEM OF MR. CHARLES FRODSHAM.



T. The tangent circle which determines the slopes and angular value of the pallet faces A B.

into two—the one advocating the remontoir and gravity escapement, the other the Graham dead-beat escapement; but the latter party, though agreed on the general principles, are greatly at issue on the details of construction. The principal difference consists in the number of teeth of the escape-wheel embraced by the anchor or pallets. The fewer the number of teeth embraced the shorter will be the arm of repose, and the

friction will necessarily be reduced to that ratio; but this subject of friction has been found to be a fallacy, for when the friction is reduced on the pallet rest it is increased on the angle of impulse. The friction has been found, moreover, to be of no detrimental importance; as a rule, it is equal to the sum of all other friction, and therefore admirably adapted to maintain a uniform vibration of the pendulum. The length of the pallet arms is the natural tangent to the semi-angle of the middle of the pallet pad; therefore the greater the number of teeth embraced in the anchor pallet the longer will be these arms.

Thus, if we were to embrace 12 teeth the length of the pallet arms would be as 5 to 26. A medium course has been adopted. Vulliamy embraced eight teeth. This number has many properties to make it a standard number, inasmuch as the length of the pallet arm is the radius of the escape-wheel; and that most important point in the construction of the escapement, the distance between the escape-wheel and the verge axes is the sum of the square of the radius—viz., 1.4142; and the chord of the angular opening of the pallets is equal to this distance—viz., 1.4142; but chronometer makers have preferred embracing larger numbers, as nine and ten. These are decidedly the best mean numbers to use, both in the construction of the highest and plainest work.

Under the head of first-class clocks for domestic use, those manufactured by English makers are the best. France, however, also exhibits excellent specimens. The clocks of A. Brocot (France, 81) are especially to be commended for their escapement pallets. The system adopted by this maker is called the pin-pallet escapement. It can be constructed with the smallest amount of drop, and is equally valuable for a highly-finished clock as it is for an economical one, or for clocks of small price. P. Drocourt (France, 99) exhibits numerous domestic clocks of great elegance and moderate price.

House
clocks.

Austria, Wirtemberg, Hesse, and the Black Forest are all admirably represented by good clocks, which display excellent workmanship, especially when considered in connexion with their prices.

The show of turret clocks is extremely limited; the most remarkable are those by J. W. Benson (United Kingdom, 4) and Gaurdin (France, not in catalogue). The latter exhibits a large clock made for Buffalo, United States. Chimes of 43 bells, with machinery by which the airs may be varied, are attached to this clock; these have been made by Bollee and Sons, of Mans, and are remarkable for their sweet tones.

Turret
clocks.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

L. C. Detouche, Paul Garnier, A. P. Borrel (France, 26, 28, and 34), and S. Fournier (United States, 3) also exhibit turret clocks. None involve any very novel construction; in all, however, the workmanship is extremely good. This applies especially to Fournier's clock, which is a most carefully constructed instrument. The paucity of turret clocks in the present Exhibition is the more remarkable as the French were extremely distinguished formerly for the manufacture of these timekeepers. The celebrated clock at the General Post Office in Paris, made by La Paute, is said to have cost 3,500*l.*, and is highly remarkable for its excellent mechanism.

Nearly all the turret clocks exhibited by France possess the remontoir and gravity escapement, and are of extremely complicated construction. It is also worthy of notice that while in England pendulums are generally used for turret clocks of 6 ft., 8 ft., and 14 ft. in length, with cylindrical bobs weighing from 100 lbs. to 500 lbs., the French seem in their pendulums rarely to exceed the second's length, and the average weight of the bob is not over 40 lbs. It may be also mentioned that the external dials are not of the large dimensions used in England; they are, however, as a rule, extremely neat.

Electric
clocks.

Electric clocks are not so numerous in the present Exhibition as might be expected from the excellence to which they have attained. The application of electricity to time has, however, several representatives. The clock exhibited by Paul Garnier (France, 28) is one of the best, combining various improvements. They may be thus enumerated:—The oscillations of the pendulum are independent of, and free of any influence from, the moving power (whether electricity or gravity). The pendulum is compensated. The rod, of white deal, is baked and soaked in a mixture of beeswax, oil of turpentine, and linseed oil, and then French polished, to prevent absorption of moisture. The compensation consists of a zinc tube (sheet zinc), resting on the adjusting nut at the bottom of the wood rod; the cast-iron bob rests on the top of the zinc tube by means of a plate screwed to the latter. The proportions are as follow:—The acting weight suspended from the curved lever, for the purpose of uplifting the impulse arms, is $2\frac{1}{2}$ drachms, exerting a pulling pressure (longitudinally) of about $\frac{1}{2}$ drachm at the point where the arms hold the curved lever, so that the actual force required to disengage the arms is a high fraction of a drachm, the hooks of the curved lever and the pin in the impulse arms being hardened and polished cast steel. Hence the pendulum becomes a correct timekeeper,

equal frequently, when due care is taken, to a first-rate astronomical clock. In the best form of electric clock the pendulum makes a contact at each oscillation by bending a spring, which in itself, as the temperature varies, will influence the rate of the clock. The manner in which the impulse is imparted to the pendulum is not entirely free from friction, and tends to produce "wobbling," as the impulse, although parallel, is not in the same plane as that in which the pendulum oscillates. The contact-makers are generally formed of iron cups containing mercury, into which dip pieces of copper with iron extremities. One enters the mercury at the moment the other leaves it, so that no spark from the direct current can oxydize the surfaces of the contact-makers, as both transmit the same current alternately—the left one to the magnet of the pendulum, the right one to the clock.

Attempts are being made by the French to introduce clocks constructed at Dieppe by machinery. They are in all respects greatly inferior to those made in other parts of France, and if their introduction be general, they will tend greatly to lower the character of French domestic clocks. As a rule, the result of attempting to manufacture clocks and watches by machinery in a plain way is soon to fall into a slovenly method, and thus to discourage good workmen. If the pride of highly-finished work is destroyed, first-rate hands can rarely be retained. The jurors of class 23 were greatly disappointed by the working parts of French clocks which had been constructed by machinery. They are far inferior to the work turned out in the villages of Lancashire, where the fabrication of our horological movements is carried on.

Machine-made clocks.

Very ingeniously constructed small, portable alarm clocks are exhibited by T. Philippe (France, 52); they strike an alarm and light a candle. Their price is extremely moderate. A Knespach (Austria, 9) exhibits a collection of excellent domestic clocks, the prices of which are also very low.

Alarm clocks.

POCKET CHRONOMETERS AND WATCHES.

No section of horology shows greater advance since the Exhibition of 1851 than that of pocket chronometers and watches. The most striking feature is an improved proportion of all the works; but the two most essential points of improvement are the increased weights and diameters of the balances, the importance of which in the construction of a pocket watch is now fully established. Although France makes a larger exhibition of watches than England, those

Pocket chronometers and watches.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

exhibited by the latter country are decidedly the best. The pocket chronometers and watches shown by Mr. Charles Frodsham, G. Blackie, M. F. Dent and Co., F. B. Adams and Son, V. Kullberg, Nicole, and Captain Parkinson and Frodsham, and J. Poole (United Kingdom, 10, 5, 9, 1, 17, 20, 22, 23) are in all respects admirable instruments.

The escapements principally in use formerly in watches were the chronometers or detached escapement and the duplex; these, though excellent in themselves, are not well adapted for these railroad days, because they will not bear rough usage. They have accordingly been almost entirely superseded by the lever escapement, which is particularly suited for all the ordinary usages of life; and, when all the other parts of the watch are of the same quality as the pocket chronometer, a most reliable timekeeper is obtained. A watch with an uncompensated balance spring is seriously affected by changes of temperature, particularly when not worn habitually. Ten degrees of Fahrenheit causes a watch to vary seven minutes per week; hence the difficulty of regulating watches except to the owner's particular wear; yet, if a watch be regularly worn, it is remarkable how nearly this error is balanced.

Great pains have been taken during recent years in England to improve the manufacture of ordinary watches. The best works are made in the Lancashire villages, and a considerable quantity of these works are annually exported to the United States, where they are cased and finished. According to the census of 1861, 23,427 persons were engaged in that year in the watch trade in England, the greater portion of whom resided in Lancashire.

Though the first-class chronometers made in France are, as a rule, inferior to those of English manufacture, they are—and especially when considered in relation to the very important question of price—very remarkable for their general excellence. Pocket chronometer and watch making have been hitherto but a very secondary manufacturing interest in France, but of late years it has greatly revived. L. Breguet, T. Le Roy, A. H. Rodinet, and L. M. Vichard (France, 7, 4, 8, 68) exhibit fine pocket chronometers and watches. M. Breguet, whose house has been long celebrated for its horological productions, also exhibits several interesting watches, among which may be noticed a keyless watch, with lever escapement, showing the phases of the moon; and a double watch, regulated by the reciprocal action of the two balances, which was made by A. L. Breguet, grandfather of the present M. Breguet, for Louis XVIII. M. Breguet also exhibits excellent chronographs.

It is, however, in cheap watches that France makes the greatest show. The efforts made by M. Goutard, of Besançon, to revive watchmaking in France, which were rewarded by a medal in 1862, appear to have been very successful. The clock and watch trade of France has, indeed, acquired enormous proportions during recent years. It is officially represented as amounting to 35,000,000*f.* annually. The principal seats of the trade are, for clocks, Paris; for watches, Besançon; and for large turret clocks, Monez (Jura). At Besançon 15,800 men, women, and children are employed in the manufacture of watch movements. There are 132 workshops, and 150 houses in the trade give out work to be executed in the private dwellings of the artisans. The Besançon watch trade manifests considerable improvement since 1855. Of 223 exhibitors in the French department of watches and their movements, 97 come from Besançon. In 1845 this town produced 51,192 watches; in 1855, 141,943; in 1865, 296,012; and the number is now said to surpass 300,000 annually. The declared official value of the watches and movements in 1866 was 17,000,000*f.* The principal establishment at Besançon is the *Ecole Municipale d'Horlogerie*, which maintains 250 pupils, and is directed by a professor.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.The Besan-
çon watch
trade.said
watch

There is also a large watchmaking trade carried on at Cluses (Savoy), where there is a school for teaching watchmaking. St. Nicolas d'Aliermont is an important seat of this art; out of an adult population of 2,500, upwards of 1,000 are engaged in watchmaking. Astronomical clocks and chronometers are also fabricated here. The total number of time-pieces annually made in this town is stated to be 144,000, valued at upwards of 1,000,000*f.* They are for the most part sent to Paris. It is worthy of remark that for the more delicate workmanship women are preferred at St. Nicolas d'Aliermont to men.

The Cluses
watch trade.

While the reporter feels it to be his duty to cite the foregoing official statistics of the Besançon watch trade, he considers it right to state that the jurors of the horological class entertain considerable doubts how far the statement may be relied on, as searching investigations lead to the conclusion that a large proportion of watches and watch movements said to be manufactured at Besançon are really constructed in Switzerland. It is well known that, though nominally French, the Besançon watchmakers are of Swiss extraction, and their work greatly resembles that of the Swiss watchmakers.

An attempt has been lately made by some Paris watch-

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Swiss
watches.

makers to introduce a decimal system of time in watches, dividing the day into 10 hours, the hours into 100 minutes, and the minutes into 100 seconds. The best illustration of this decimal division will be seen in the watches exhibited by F. Cacheleux (France).

The watch manufacture of Switzerland is represented in the present Exhibition by 163 exhibitors, sixty-seven of whom come from the Bernese Jura. It is not a little curious that, while France is now endeavouring to supplant Switzerland in the manufacture of cheap watches, the watch trade of the latter country appears to have come from France, which enjoyed a monopoly in making these instruments when their manufacture was unknown in Switzerland. This branch of industry, for which the latter country is so remarkable, is of comparatively recent growth, and is said to have been founded by French refugees who fled to these mountain villages for shelter from political persecution at the close of the last century. Even as late as 50 years ago it had not grown to any great extent; factories were few in number; a large number of the watchmakers being agriculturists or small farmers, who in the winter season devoted their time to watchmaking.

The repeating motion, for which Swiss watchmakers are now celebrated, had its origin in England, and when such complicated mechanism as that involved in the construction of a repeater is considered, it is evident that there must have been a large amount of latent mechanical ingenuity among the Swiss, for they had formerly little communication with England or France, access to these countries being difficult; and yet in a very short time after the art of watchmaking was introduced into Switzerland good watches were made, including beautiful and accurate repeaters. In 1851 the watch trade had grown to an enormous industry, some of the Swiss houses making as many as 500,000 watches yearly, and a large number turning out their 10,000 and 20,000 per annum. These watches are not, of course, either of high class or high price. Most of the works continue to be made in the country parts of Switzerland; but those with beautifully finished cases and delicate workmanship are principally constructed in Geneva. The movements are almost entirely made in the Val de Joux, by various hands. A remarkable exception may be seen in the case of a repeater exhibited by Auguste Baud (Switzerland, 3), all the parts of which have been constructed by himself. Watches will be found in this department from the humble, but by no means rough, watch of 8f. to the pocket chronometer of 1,250f. Among the

cheap watches are some curious specimens constructed for exportation to China. A school for teaching watchmaking, founded in Geneva in 1824, turns out extremely fine work. Pupils are admitted at the age of 14, and may remain in the establishment four years and a half, during which time they are taught all horological processes. The terms are—for natives of Switzerland, 5f. a month; and for those of other countries, 20f. Natives of Switzerland also enjoy the advantage of being provided gratuitously with all necessary watch-making tools. During the winter months the pupils have the privilege of attending, gratuitously, courses of lectures, given in the evening, on geometry, mechanics, and linear drawing. There are also four other schools in Switzerland, with professors at their heads.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Schools for
teaching
watch mak-
ing.

The highest-class watches in the Swiss department are shown by H. R. Ekegren, G. Faure, L. Favre Lebet, Humbert Ramuz, S. Mairet; Pateck, Philippe, and Co.; Rossel and Son, and U. Nardin (Switzerland, 17, 18, 19, 35, 120, 130, 142, and 147).

The chief characteristic of the Swiss first-class watches is their horological ingenuity. Many combine movements of an extremely complicated nature, while the finish of the cases in the majority of the specimens exhibited leaves nothing to be desired.

Those interested in the curiosities of watchmaking will find, in the French as well as in the Swiss department, several extremely minute watches. The smallest is that exhibited by A. Rodanet and Co. (France, 8), which is set in the stem of a gold pencil case. Rossell and Co., of Geneva (Switzerland, 142), also show several remarkable specimens of small watches, very highly finished. Some curious spherical watches are shown in the Russian department by H. Son (not in catalogue); but these, as well as the few watches exhibited by Turkey, Greece, and Spain, consist of French or Swiss movements. A small clock, in the form of a sunflower, is exhibited by H. Ader (Russia, 5), but it is more remarkable for its singularity of appearance than for excellence of construction.

It is worthy of notice that the fusee, on which the English watchmakers rely so much in the construction of their best watches, is entirely suppressed among the Continental makers. The absence of this important movement can only be accounted for by a desire to produce a cheap watch. Winding with the pendant—or, as it is popularly called, the keyless watch—is very general among the watches exhibited. This invention, however, is by no means so novel as is generally supposed, having been first introduced by Mr. John Arnold,

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

Watch
jewellers.

in 1823, for the convenience of a naval officer who had lost his right arm.

Under the head of watch jewellers, makers of dials, cases, hands, gilders, &c., the objects exhibited, though less attractive to the general visitor, possess great value, and are remarkable for their excellence and high finish.

L. Gindraux (France, 14) and R. Claxton and S. Holdsworth (United Kingdom, 7 and 13) exhibit very complete and in many respects remarkable collections of clock, chronometer, and watch jewels, set and unset. They consist of diamonds, rubies, sapphires, chrysolites, garnets, and aquamarines, which are the stones used for horological purposes. There are jewel-holes of every description, clock and chronometer pallets, ruby rollers for the duplex escapement, ruby cylinders for horizontal movement; solid chronometer rollers, which serve the purpose of impulse and roller combined; ruby pins, flatted, oval, and triangular; caps and points for marine compasses, and draw-plate holes capable of drawing gold wire from 1,000 to 2,500 yards to the ounce troy. Mr. Holdsworth has also a case of assorted watch jewels for exportation, in order to meet a want long felt by watchmakers living at a distance from the place of manufacture, by which means they may have a regularly assorted number of jewels in different sizes. I. L. Ducommun and Montandon Brothers (France, 21 and 24) exhibit a beautiful series of chronometer and watch springs.

Switzerland exhibits a great variety of watch movements, jewels, and dials. The glass dials with gold enamelled figures exhibited by Corcelle-Tournier and Co. (10) are extremely beautiful, and highly deserve examination.

Some machines are also shown in the Swiss department of ingenious construction, applicable to the manufacture of clocks and watches. It is worthy of remark that the clockmakers were the first who employed special machines for their manufactures. Their wheel-cutting engine has been ascribed to the celebrated Dr. Hooke, who is said to have invented it in 1655. Its use rapidly spread through England and the Continent. The gradual improvement of this machine, and the successive forms which it assumed as the art of construction was matured, form a very interesting history. English clockmakers have largely contributed to its perfection. Henry Sully, an English clockmaker who removed to Paris in 1718, carried with him, among other excellent tools, a cutting engine, which excited great admiration in that city. The form of the Continental engine is, however, derived from the engine improved by Hulot in 1763. The fusee-engine, which is another special clockmakers' machine, has

also tended greatly to the perfection of machines for working in metal; and in many other ways the horologist has been of signal advantage to mechanical science.

MR. WELD
ON HORO-
LOGICAL IN-
STRUMENTS.

There is, indeed, no branch of mechanical art on which man has devoted more labour than that relating to horology. Many artists in watchmaking work at artisans' wages, and many horologists of various countries cultivate their art *con amore*, devoting themselves to its improvement with extraordinary energy and assiduity.

The advantages to be derived from the possession of a clock or watch of perfect accuracy (were such a thing possible) could hardly be over-estimated. The science of astronomy in particular would receive important benefit from such an instrument. But as no timekeeper has yet been constructed that can be relied on as being absolutely free from error, it is evident that there is still room for improvement. The sources of irregularity have long engaged the attention of many able scientific investigators, and, as we have seen, very numerous contrivances for counteracting them have been devised.

An impartial examination of the progress made in horological science since 1862, as represented by the Paris Exhibition of this year, is highly satisfactory. Absolute perfection has not, indeed, been obtained; but great progress has been made, and the result is that excellent timekeepers are much more common than they were a few years ago, and that their prices, although wages have risen considerably during recent years, are much less than they were.

Gratifying
progress of
horological
science.

the medical profession. The medical profession is not only a body of men, but it is a body of men who are engaged in a common work, and who are engaged in a common work which is of the highest importance to the human race.

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REPORT ON PERFUMERY. — (Class 25.) —
By SYDNEY WHITING, Esq.

MR.
WHITING
ON PER-
FUMERY.

SECTION I.—PERFUMERY AS IT WAS.

IN the same way that the ceramic productions of modern times, with all their beauty of form, delicacy of pencilling, and costliness of material, must trace their origin to the lap of Nature, when the rough utensil of the savage was rudely moulded and baked in the sun, so the art of perfumery, now brought to such perfection, has its sources in the shadowy vistas of the past, when the scented wood, bark, or gum of tropical vegetation was burned or bruised by primitive man for his religious ceremonies or his personal wants. The especial predilection, however, which the wild tribes of the earth evince for odours has reference more to pungency than delicacy of aroma, and may be said, perhaps, to differ as much from modern taste as the Algerine music of the Exhibition differs from a symphony of Mozart. In the province of Fernando Po, the odour of the pomatum called "Tola" is so powerful that the approach to a native village is indicated by its intense smell, penetrating even the densest brushwood. But occasionally, the favourite scent of uncivilised people would be pronounced excellent by the modern connoisseur; such, for example, as a perfume in great request on the Rio Negro, called Umari, which is obtained by lifting the bark of the tree producing it (*Humirium floribundum*) and inserting under the covering pieces of cotton wool which, at the end of a month, becomes saturated with the essence. But this single illustration of the identity of tastes between savage and civilised nations is quite exceptional, and the procuration of essences by maceration or distillation was probably quite unknown to the earlier denizens of the woods. Nature, however, who takes especial care in providing for the wants of her untutored children, and seems only to leave them to their own devices when civilisation advances and enables them to do without her more ostensible supervision, gives to savage tribes in many parts of the world a natural soap, or, at least, a saponaceous grass, which, mixed with oil and highly scented, must be somewhat similar to the refined productions of Paris and London. In the Philippine Island this grass is called "Go-go," and British Guiana (*vide* Catalogue) possesses not only a wood used by the natives for detergent purposes, but a vegetable tallow from a species of

Perfumery
amongst
savages.

MR.
WHITING
ON PER-
FUMERY.

Egyptian
perfumes.

the "Myristica," which, mixed with alkali, forms a soap of the finest balsamic character.

The descriptions which Athenæus and other authors, Roman and Greek, give of Egyptian manners prove that perfumes entered largely their religious and personal customs, while the burning of scented woods and aromatic gums (from which our word perfume, "by fire") was a ceremony at which not only the priests but the Egyptian kings assisted, the principal substances being frankincense, crocus, cassia, lign-aloe, and orris. The process of embalming, of course, involved the use of scented substances of all kinds; but the quantity of aromatics used for toilet purposes exceeded all other consumption: and here we arrive at one of the great landmarks in the ocean of perfumery, for the Egyptians were the first manufacturers of perfumes, inasmuch as the unguents used by the priests were compounded with great skill, and a large variety of cosmetics were used. The preparations of those unguents were so admirable that a specimen in the Alnwick Castle Museum has retained its scent after the lapse of 3,000 or 4,000 years. With these extraordinary people, who, without a literature, handed down their habits and manners to remote posterity, the custom originated of the women staining their fingers and the palms of their hands with a dye made from the leaves of the far-famed henna (*Lawsonia inermis*); and the rage for perfumes of all kinds arrived at its culmination at about the period when Cleopatra made such successful use of them in her interviews with Mark Antony.

Jewish
perfumes.

Amongst the Jews the use of perfumery in all its various refined characteristics came into use after the Israelite captivity in Egypt, though, long before that period, it is impossible they could have been ignorant of those aromatic products which, with more or less power of fragrance, betrayed their presence in every locality where shrubs and flowers flourished. The well-known expression, "balm of Gilead," is referable to a gum made from a shrub called the Amyris, which grew in large quantities on the mountains of Gilead; and Strabo speaks of a field near Jericho full of those trees; but still "perfumery," in the sense we use the word, was borrowed from the Egyptians by the Jews, who, improving in all they had learnt, out-rivalled their former masters and became the greatest experts of the ancient world in preparing odours of all kinds. The custom of anointing the head, the application of kohl to give a languishing expression to the eye, the use of metal mirrors, and the practice of embalming, were all copied from the Egyptians, while other peculiarities have descended to the present day. When the Empress Eugénie

appeared at the festival of the Bœuf-gras, in 1860, with her hair sprinkled with gold-dust, it is impossible she was not aware that she was following a custom of the Jewish ladies 3,000 years ago.*

MR.
WHITING
ON PER-
FUMERY.

In the early periods under notice Babylon, amongst the Asiatic nations, was the principal market for perfumes and cosmetics, consequent, no doubt, on the exceeding richness of her flora. Some of the Assyrian perfume bottles, with cuneiform inscriptions, found by Mr. Layard in the excavations at Nimroud, are very curious, and from these and other proofs we find that Babylonian liquid essences were generally contained in bottles of glass or alabaster, and the ointment in boxes of porcelain or chalcedony.

Assyrian
perfumes.

The Persians also exhibited an extraordinary love of sweet smells, a fact scarcely to be wondered at, for Nature had carpeted whole districts of the country with flowers of every variety, one of the lily tribe being so numerous as to give its name "Souson" to a town so denominated. In short, all the Asiatic nations exhibited an intense love of perfumes; but we had not yet arrived at the period when alcoholic scents became known, those useful products of aroma and spirit, which, preserved in bottles—in the form of which ingenuity seems illimitable—are sent to the nethermost ends of the earth.

Persian
perfumes.

Next, we must turn for a moment to the Hellenic races, who, in perfumery, as in all other arts, set their seal upon the world. Here we find that every sacrifice was accompanied by libations of wine and the burning of frankincense, and at every festival cosmetics were largely consumed. Upon successfully emerging from the terrific ordeal of the Eleusinian mysteries the neophyte was made acquainted with the agreeable fact that around the Elysian Fields flows a river of perfumes deep enough to swim in, and that 500 fountains of sweetest essences were for ever at play—a fact no doubt known to the more erudite exhibitors of perfumes in the Exhibition, who, being in despair at emulating with any chance of success so much excellence in the fountain

Greek
perfumes.

* The reporter on this Class is indebted to Mr. Rimmel for the courtesy of his forwarding him a copy of his charming work called "The Book of Perfumes," and he is also beholden to Dr. Piesse for his elaborate work called "The Art of Perfumery," both of which volumes have been of considerable use in the compilation of the following paper. In these two books are exhausted all that the scientific or non-scientific reader could desire to know in respect to perfumery, and both productions are remarkable for the absence of every attempt to advertise the various articles which the authors vend at their establishments. The delicacy and tact with which this has been avoided by both gentlemen is worthy of especial remark, while it manifestly greatly assists in drawing the line between the mere seller of an article across the counter and those who raise a trade into a profession by scientific knowledge and literary skill.

MR.
WHITING
ON PER-
FUMERY.

line, resolved to shine by contrast, and their success is undoubted. The Greeks, as a nation, exhibited wonderful finesse in mixing their scents, and in this women were principally employed; while the use of perfumes, unguents, and cosmetics became in the time of Solon so prevalent that he prohibited the sale of perfumes; but sumptuary laws affecting the person are generally of no avail, and the perfumery shops in the time of the great lawgiver were the lounging-places of the Greek dandies, and the resort of ladies who came for an unguent to preserve beauty for ever, or for an elixir to perpetuate youth.

Roman
perfumes.

The Romans, until the period of their conquests, were too simple-minded a race to be acquainted with the art of perfumery to any considerable extent; but a conquering nation absorbs both the vices and virtues of the people whom they subdue, together with a taste for their habits and customs. Thus, many of the refined luxuries of southern Italy, colonised by the Greeks, became adopted by the Roman invaders, and were soon exported to the capital of the world. From that period perfumery as an art took its rise amongst the Romans, increasing in importance after their subjugation of Asia; while, as a curious instance of the repetition of events, Julius Cæsar issued a mandate prohibiting the import trade of perfumery, after the manner of Solon at Athens, and with, it is recorded, a similar want of success in carrying it into execution. Caligula, in the vain attempt, perhaps, to deodorise his moral ill odours, constantly bathed in perfumed waters; and in Nero's golden palace the drinking-tables were made with concealed silver pipes, which cast on the guests a spray of essences. Had the Emperor watered the streets of Rome with fragrant liquid, history would have had a better deed to record than the one which has rendered his name infamous. Of the Roman baths it need scarcely be remarked they were celebrated through all the world, and their "unctuarium" resembled a modern apothecary's shop, owing to the pots and jars containing the materials used for every portion of the body. To enter for a moment "mundus muliebris," the chief cosmetics at a Roman lady's toilet were solid and liquid unguents and powdered perfumes. Some of these preparations cost sums of money which spoke of extravagance and luxury unknown before or since; and the manner of their application required the greatest skill, taste, and care on the part of the attendants. Indeed, the Roman lady at her toilet, surrounded by slaves from almost every clime, marshalled by the ornatrix or mistress of the toilet, would make the subject of a classic interior worthy of the delicate skill of Gérôme, or of the genius of the Belgian

Cosmetics.

painter of such scenes—Coomans. To the Roman belles we are indebted for the custom, now unfortunately so common amongst English ladies, of using liquids and other means for changing the colour of their hair, an ill compliment to Nature, which she is usually not backward in punishing, either by premature grayness or total loss of ciliar ornament. The dye mostly in vogue with the dark-haired beauties of the Imperial city was one for turning black hair into a sandy or fair colour, a tint as much desired at the present time as in the earlier days of Roman fashion; and it is probable the predilection for auburn, or light brown, or golden hair took its rise from the early poets and painters attributing, with almost one accord, sunny or auburn hair to Anadyomene or Aphrodite; and, while the Romans vulgarised her under the name of Venus, they did not forget to copy by every possible art one of the chief characteristics of her loveliness. The composition of this dye consisted of a soap from Germany made of goat's fat and ashes—no doubt containing some very powerful alkali—while, curiously enough, this soap is stated to be the first indication of that article amongst the Romans, and if so the natives of Tahiti were in this respect superior to the most civilised people in the world; but Nature, not civilisation, is the handmaiden of savage life, and bestows such boons as sciences, and art, and knowledge only copy with slow and uncertain steps. A black dye used at Rome for retarding the ravages of times, or, scientifically speaking, to prevent the medullary juices from becoming dry, was said to be made from leeches putrefied in wine and vinegar; but there must be some mistake in respect to this dainty decoction, for wine and vinegar are powerful antiseptics, and prevent what Liebig terms *eremacausis*.

But however much the Romans ultimately excelled in the manufactory of unguents and pomades, we must turn to Arabia in the tenth century, for the application of chemistry to the art of perfumery in the extended signification of the word. Avicenna is the name of the illustrious Arabian doctor who is stated to have been the first discoverer of extracting the perfume of flowers by distillation, and, inasmuch as this is the real “open sesame” to all the perfumed treasures of the world, by which the latent sweets of Nature's most lovely productions are made to yield up their secrets, the discovery was an all-important one; and when it is further understood that the rose was the first to raise the siege and give up its garrison of odours, the conquest of such a citadel was at the period unique. The first experiment of the great savaⁿ*

Arabian
perfumes.
First pro-
duction of
rose water.

* Avicenna is said to have written nearly one hundred volumes during his nomadic life, twenty of which were a general encyclopædia.

MR.
WHITING
ON PER-
FUMERY.

was made on a delicious species of the flower called "Rosa centifolia," and from it he produced the world-famous composition known as "rose-water;" the hundred leaves of the flower yielding to the skill of the magician an aroma more precious in its aggregate commercial uses than the philosopher's stone or the transmutation of metals, supposing either or both were possible. Saladin literally washed the floors and walls of Omar's Mosque with the fragrant liquid; and throughout the whole of the East it became the custom to salute the welcome guest with a douche of the delightful water. It is curious, however, that, loving the scent of the rose as the Orientals loved it, they should have shown so much partiality for musk, which, in some cases, they mixed with the mortar used in the construction of their places of worship; and Paradise, according to the Koran, is peopled with nymphs made of musk—at least, so declares no less an authority than the Prophet himself.

Origin of
otto of rose.

Having paid a passing tribute of praise to the great Arabian physiologist and chemist Avicenna, it is due to specially mention the country which originated that quintessence of perfumes the costly and delicious otto of rose, but which, like all concentrated forms of odours, requires proper dilution for its employment. India, so tradition states, claims the honour of the discovery; and though it is now produced by distillation, there is little doubt, in the early periods of Indian chronicles, it was simply and easily made—at least, such is a fair supposition, since we learn, from works on Asiatic manners and customs, that the origin of the scent was traced to a certain beautiful Sultana's observing, while walking in her garden, through which ran a canal of rose-water, oily particles floating on the surface, which turned out to be the veritable otto. Of course, these eastern stories must be taken *cum grano salis*, and not a small grain either; but at least they prove the probable knowledge of the otto in the earliest periods, and also suggest that in manufacturing the odour before modern processes were known, there must have been an enormous waste of the roses; but the prodigality of Nature in those climes was ready for the demand, howsoever extensive it might have been. The early Indian poets, as well as later ones, all sang the praises of Flora's lovely children in verses more or less musical; and two thousand years ago a Sanskrit writer named Kálidása expressly refers to perfumes in his work, showing how they were used for sacred and domestic purposes. The scented woods of India, which in the form of boxes and small *articles de luxe*, abound in the Indian department of the Exhibition, are as familiar to us all as "household words," and these

woods in ancient days were greatly prized by the natives; while musk, civet, ambergris, patchouly, and kus-kus were, there is little doubt, all duly appreciated by the refined and sensitive Hindu.

MR.
WHITING
ON PER-
FUMERY.
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The ancient social manners and customs of the Chinese, Japanese, and of the Indian Archipelago, are comparatively a sealed book to us; but there is no question that the originators of the joss-sticks and bronze urns (some of the ancient specimens of which exhibit extraordinary skill in the mixture of metals) were large consumers of perfume of every description. Musk, in the earliest periods of Chinese history, must have played its usual prominent part in all compound perfumes, more especially as many of the northern provinces of China are, par excellence, the habitat of the musk-deer—a little animal about the size of a greyhound, and which subscribes largely to the commerce of the eastern world. The scent-bag or gland is only found in the male, and, whether given by Nature as a source of attraction to the female, or as a means of confounding its enemies with its odour, is not recorded by naturalists; the latter view, however, is not borne out by any dislike which the genus homo evinces for this pungent and extraordinary secretion. When once musk has been freely used its obliteration from the sense of smell is almost impossible, as an instance of which it is stated by Dr. Piesse that the walls of Malmaison, inhabited more than forty years ago by the Empress Josephine, though since then repeatedly rubbed and painted, and even washed with aquafortis, still retain the odour of this imperishable scent, of which it is needless to add the Empress was inordinately fond. The Tonquin or Chinese musk is most prized in the English market, and varies from 26s. to 32s. per ounce in the pod, but is adulterated by all sorts of ingenious means at the hands of the exporters. As in the case of many of the savage tribes, the Chinese were possessed from time immemorial of a substitute for soap, called “keen;” but this was used chiefly for washing their clothes, since cosmetics and oil formed their only personal detergives, and the same fact, it is to be feared, applies in reference to their habits at the present day.

Musk, and
the inde-
structibility
of its odour.

SECTION II.—PERFUMERY AS IT IS.

The French group of vitrines devoted to the display of perfumery in the Exhibition consists of a handsome court, in the centre of which is an oasis in the desert of free seats, in the form of a comfortable settee, where the weary traveller may rest and be thankful, if fortunate enough to find a vacant place. The great perfumers of France are here represented, France.

MR.
WHITING
ON PER-
FUMERY.

not as a rule, by an attendant *in propria personâ*, but by rows of bottles, piles of soap, and packets of scent, each and all suggestive of the large amount of labour, taste, and capital expended in their production. The French exports of perfumery in 1864 (which is the latest date that official returns have been classified and published) was 3,104,797 kilogrammes, valued at 15,523,985f., which conveys some idea of the immense extent of this branch of industry (steadily on the increase), which gives employment to a large number of women and children, as well as of men.

Blending of
perfumes.

M. Mero (13)* exhibits in the French Court very valuable specimens of those materials employed by perfumers which are used largely in the process of mixing. England, from the rapid strides she is making in the manufacture of sweet odours, is becoming one of M. Mero's best customers, and as this exhibitor is not a mere vendor of articles *de toilette*, but a scientific manufacturer, it is well to make the mention of his name the text for explaining that the process of what is technically called "mixing" is a very important and delicate one; so much so, that if a perfumer desires to make a bouquet from primitive odours he must take such essences as "chord" together; and that, as a painter blends his colours, so must a perfumer blend his scents. Two colours that are concentrated in intensity will neutralize one another and produce an inodorous body, in the same way that two loud sounds may be made to produce silence, and two strong lights to produce darkness.† The bottles, therefore, of M. Mero, and of the other perfumers known to fame in their several walks, though possessing in themselves nothing attractive, are suggestive of strange complications; and so it will be found with the most simple and humble articles spread everywhere around.

M. Bermond (6) claims a specialty for violet extract. The flowers (*Violet odorato*) from which this is made grow principally in France and Sardinia. The odour of this plant is procured in combination with spirit, oil, or suet, and the essence is produced by digesting the pomade in refined alcohol.

Pomade.

M. Chiris (1) is known for his excellent flower pomades and oils. These are made by infusing flowers in lard, suet, or oil, the chief necessity being to use as a basis a perfectly inodorous grease, so that its own odour may in no way interfere with the especial flowers to be introduced. It is, perhaps, unnecessary to add that the bear is wholly innocent

* These numbers refer to those in the French catalogue.

† Sir David Brewster.

MR.
WHITING
ON PER-
FUMERY.

of contributing his adipose portions in the making of pomades, "bear's grease" being one of those titles, though used by respectable firms, which makes the line separating shop trickery from trade nomenclature very small indeed. The fat of the bear, from its rancid and coarse nature, involves the presence of those especial elements destructive to pomades of all sorts. This exhibitor, M. Chiris, employs 500 work-people of both sexes in the different departments of his manufactories, and lays claim to being the first cultivator of the Rose geranium in Algeria.

M. Morrin (35) is the representative of the largest house in Paris for the manufacture of those toilet appendages which, if examined with a due regard to their uses and abuses, would carry us within the sacred adytum of my lady's chamber. Here the discreet reporter will pause at the threshold, nor enter too fully into the *modus operandi* in the application of rouge, "blue" (for tracing artificial veins), Persian antimony (for giving depth to the colour of the eye), and other prettily encased articles too numerous to mention. Also, he will only dare to wonder in silence when contemplating the outer covering of the "étui mystérieux."

Toilet
mysteries.

M. Séguy (33) exhibits specimens of what he is pleased to term "blanc Nymphéa," said to be made of burnt shell, but which is stated to consist of an oxide of bismuth mixed by trituration with rose-water. Ladies should be aware of the composition of these various face-powders, so that they may select the least injurious to the skin; and that popularly known as "violet powder" is the most preferable. It is made of starch and orris-root powder, scented by various additions, and its application by the common "powder puff" involves an enormous consumption of swan skins, from which they are made. A good and *safe* powder called "Pestachio" powder is manufactured from levigated talc, finely sifted, and it is not affected by impure atmosphere—a desideratum devoutly to be desired.

Face pow-
ders.

M. Piver (48), who is the leading perfumer in France, does not on the present occasion, from an artistic point of view, make so elegant a display as on former Exhibition occasions; but his attendant will be found on duty, ready to cast a jet of sweet odours on the passers by; but it proceeds from a sort of drawer, and is pumped up ready for use by a most unrefined apparatus underneath. Some degree of harmony should be attempted in all things, and there seems an incongruity in delicate odours being evoked by material means so visible to the eye. M. Piver could well afford, from the high reputation he enjoys, to discard all adventitious means of attracting the public, either by so-called fountains

MR.
WHITING
ON PER-
FUMERY.

Various
means of
extracting
fragrance
from scented
bodies.

or the gratuitous sprinkling of scents, and one would rather such matters were left to the mere shopman. To M. Piver is due the merit of numberless improvements in perfumery, and while others are content to bring out a new sort of bottle, perhaps, or pretty envelope for soap or scent, this exhibitor has brought capital, science, and untiring energy to bear upon the subject, which is evidently a labour of love with him. And well it may be, for what branch of industry so fascinating as the subjugation and retention of the exquisite though evanescent perfume of flowers? To entrap their volatile odours and render them permanent is an art similar to that which catches the rays of light and transfixes them in endless forms of beauty and use. It should be understood that there are four principal means of extracting fragrance from scented bodies. *Distillation* is too familiar a process to require description; but, *en passant*, it may be observed that an improvement in the art consists in suspending the flowers in the still on a sort of sieve, and allowing a jet of steam to pass through and carry off the fragrant particles. To illustrate the entire process of distillation, Mr. Rimmel has erected, near the entrance of the Grande Porte, an outhouse or cottage, containing a still in action, and here those curious on the subject will learn all that relates to it. *Expression* is confined to obtaining essences from the rinds of the citrine series, comprising lemon, orange, bigarrade, bergamot, cedrat, and limette. The common and rough process by which we obtain perry and cider, in an unscientific way, describes the manner of working by "expression," but the mode varies in different countries. *Maceration* and *absorption* are very curious processes, and especially worth notice, both being founded on the intense attraction which fragrant molecules exhibit towards fatty bodies—a strange predilection, which has proved of enormous use to manufacturers. It may be figuratively described as the soul entering into the body—Psyche for the nonce, as the offspring of Flora, wedded to materiality. Maceration is used for the less delicate flowers; for even in the sphere of dainty sweets there are shades and degrees of delicacy, such as the rose, orange jonquil, violet, and cassia. A certain quantity of grease being placed in a pan and brought to an oily consistency, flowers are then thrown in and left in secret communion with the object of their strange affection, after which the grease is taken out and pressed in horsehair bags, when the captive essences are obtained. The process of absorption, or what the French term "enfleurage," is chiefly confined to extracting the aroma of the jasmine or tuberose, *their* tender souls not being capable of bearing the same amount of heat as their

more robust relatives. M. Séméria (4), who exhibits in the French department of the Exhibition, has invented a new mode of enfleurage by placing the flowers on nets suspended between the frames in lieu of laying them in the grease.

MR.
WHITING
ON PER-
FUMERY.

M. Gellée (6) is the originator of the "monster toilet soap," which has met with considerable success. The time will be remembered by most of us when only small cakes of soap were in use, about the dimensions of the well-known Windsor tablet; but to this exhibitor is due the introduction of these brobdignagian specimens so consonant with the English taste—large basins and plenty of water.

Soaps, toilet
vinegar, &c.

M. Phillippe (21) exhibits a specialty called eau dentifrice de Phillippe, which, it is stated, has an extensive sale. What this especial preparation may be is a mystery probably only known to the maker; but whatever its composition it should be remembered that all dentifrice is injurious if containing any ingredient likely to injure the enamel of the teeth. The mixture known as camphorated chalk is perhaps the best of tooth powders in common use.

M. Chardin (29) is noted for his shaving soap, no small honour when it is remembered that shaving is one of the few personal acts of our daily life, always inconvenient, and often painful. The pleasure of feeling an emulsient cream upon the face, in lieu of a stinging alkali or resinous compound, need scarcely be insisted on; and to have achieved success in the former product is worthy of record. "A potash soft soap of lard" eminently possesses this desideratum of creamy softness, while added to its merciful qualities is a beautiful pearly appearance, which might suggest to the ingenious fabricator the title of "Savon de Cleopâtre," in honour of that celebrated act of extravagance which history is so tenacious of repeating. It is, however, composed of clarified lard, potash ley, rectified spirit, and otto of roses.

M. Bully (57) exhibits specimens of his well-known toilet vinegar, than which there scarcely exists a more refreshing appendage to the chamber of the ailing. Though there are many varieties of this febrifuge, vinegar, or its substitute in the form of acetic acid, is its basis, and this, with a mixture of the essence of perfumes, according to the taste and judgment of the maker, is the secret of its composition. Toilet vinegar, which becomes opaque in water, is rendered so by adding gum-resin, myrrh, benzoin, storax, or tolu.

M. Mougeot (59) exhibits soap inlaid in colours, and a pretty effect is obtained thereby—far more desirable than the metallic inlayings in soap as shown by several of the French and English makers of the article. Not only is metal in combination with saponaceous articles a discord to

MR.
WHITING
ON PER-
FUMERY.

the touch, but the question arises what becomes of it when the adjacent portions of soap dissolve in the water? If, in answer to this, it is stated that the metallic inlays are only superficial, still the response and objection are obvious—why assume an incongruity even in trifling matters?

M. Botot (23), disdaining the confederation of the vitrines in the court where his countrymen have established their bund, exhibits his perfumery outside the carré, in the very centre of the Mobilier passage, and makes a pretty display of *articles de toilette*. His perfumed fountain, the best of the few in the Exhibition, consists of a bronze female figure, pouring perfume from an urn, by which hundreds of pocket-handkerchiefs are scented every day.

Difficulty
of examina-
tion.

In the French department or court, where we have, perhaps, lingered too long, are sixty-two exhibitors, most of them, no doubt, as much deserving of notice as those already mentioned; but in many instances a few bottles and toilet paraphernalia carefully locked up in glass cases, with no representative to indicate specialties, afforded little opportunity for examination; and the same remark applies to all the smaller objects in the Exhibition under lock and key, especially in Class 26, presently to be reported upon; so that the best mode of procedure is to endeavour to impart a general interest to the topic under discussion, and to induce the explorer to regard objects not only with the outward senses, but with the understanding. Leaving, therefore, the French exhibitors, we find, by a general inspection of the perfumery departments throughout the building, that there is not much which offers itself for a critical analysis, not only from the foregone reasons, but because of the extreme paucity, as a general rule, of the display of scents and odours.

Prussia.
Claimants
for origi-
nating eau
de Cologne.

In the Prussian section of the building there are many aspirants for the honour of being descended from the family who originally manufactured the celebrated perfume called eau de Cologne; but as this is a point for others to determine it will be our duty, *ex necessitate rei*, to draw attention to a few facts on the subject. Johann M. Farina (19) exhibits an ebonized armoire, with a majolica fountain holding flowers, and the claims of this exhibitor on the subject seem conclusive, till at a short distance rises, in all its grandeur, a large monumental-looking structure, as if it had been erected in memory of departed spirits rather than in honour of existing ones. Rows of eau de Cologne bottles, medallions, niches, carvings, bronze figures, and a little fountain, each and all surmounted by the Prussian eagle, ready to swoop upon the daring sceptic, bid the spectator pause and exclaim,

“ This, in truth, must be the real J. M. Farina, and none other can dispute the fact ;” when, lo ! a few yards further on, yet another claimant with the same cabalistic initials places in your hand the copy of a genuine pedigree setting forth the exhibitor’s claim to a direct descent from the great source of the water of waters. Bewildered by the conflicting evidence, it is as satisfactory as agreeable to know that the disentanglement of the question rests with the jurors ; but competent authorities declare that the excellence of the perfume almost entirely depends upon the purity of the spirit employed as its basis. Spirits made from malt and other materials *not* vinous will never produce eau de Cologne of a high character, owing, it is believed, amongst other causes, to the odour of fusel oil in the first and to ænanthic ether in the second. A good and cheap eau de Cologne, which may be denominated as “ first class,” is made as follows :—Spirits of wine from grape, 60 over proof ; otto of neroli (pétrole), ditto (bigarrade), rosemary, orange zeste, citron zeste, and bergamot. An inferior quality is made from spirits of corn, otto of petite grain, neroli (pétrole), rosemary, orange-peel, lemon, and bergamot. Now, be it observed, that neroli, without which neither genuine eau de Cologne nor a good imitation of it can be made, is an essence obtained from orange blossoms (the bitter species, *Citrus bigarradia*), and when one considers the hundreds of tons of flowers plucked and consumed for the purpose of perfumery, the enormous consumption of leaves for the distillation of an essential oil called petit grain, and that from the rind of the fruit yet another essence is evoked called oil of Portugal, the affluent nature of this beautiful tree may be in some degree understood. The edible orange tree (*Citrus aurantium*) also produces essences, while the export of the fruit itself is something fabulous. In England, as we all know, the peel of the orange is made into conserve ; so that almost every portion of this wonderful production of nature is delightful to the senses, and a means of wealth and enjoyment to man. Under these circumstances, it would appear that the manufacturer of eau de Cologne who vends the best article is the proper one to patronise, without reference to ancestry.

Leaving the various candidates in the Cologne Court to their pedigrees and perfumes, a further search for objects in the class under discussion takes us to Italy, whose flower fields almost rival those of France, but whose display of specimens in the Exhibition is very limited. Tuscany has the honour of growing the most fragrant orris-root in the world, and the farms of violets in some of the provinces literally paint the earth. Exhibitors in this court amount to only

MR.
WHITING
ON PER-
FUMERY.

Various
modes of
manufac-
turing eau
de Cologne

Italy.

Orris root.

MR.
WHITING
ON PER-
FUMERY.

Other
Foreign
Courts.

seventeen, in almost all cases being venders of those products already mentioned or yet to be alluded to.

Austria, though so rich in many of her exhibits, makes but a small display in this class, her perfume trade being represented by only eight names. Her soaps, dyes for the hair, and other ordinary toilet articles, do not call for especial notice; but it may be mentioned that Herr Leyer (7), of Wetzeldorf, in Styria, is celebrated in southern Germany for a pomade made of strawberries.

Belgium also makes a very limited display of perfumery, and she places some of her *articles de toilette* in Class 44 (chemical and pharmaceutical products), as well as in Class 25. She appears to excel in the manufacture of household soaps; but, as the French export of perfumery to Belgium in 1864 amounted to 248,850 kilogrammes, we gather that she is not a large manufacturer of essences from her own flower-farms.

Switzerland has only nine exhibitors, who vend the ordinary toilet appendages.

Portugal, the land of the citron and orange and the centre of an enormous export of materials made from her indigenous flora, has not even a list of perfumery in the French catalogue—at least, in the third edition.

Denmark, Sweden, and Norway scarcely enter an appearance; and Russia, who, if pomades were really composed of bears' grease, might make an extensive display in that article, merely collects the products of other countries—soap, of course, being an exception.

Turkey, so associated with kohl, henna, and perfumes for burning—does not demand more than a passing word; and, though the obliging attendant submitted with great equanimity to a cross-questioning as to any matters of especial interest connected with toilet articles as used in the harems, his dignified reticence left nothing to record; but, *en passant*, it may be mentioned that the Turks make one of the best dyes for turning the hair black of any other country. The Armenians are great in the production of this article, the principal ingredient in which is a metallic mixture brought from Egypt; but the secret of its dyeing properties is referable to the pyrogallic acid which the compound contains. Pastilles, perfumed goods of all kinds, which from their odour might belong to Class 25, but from their uses to some of the other divisions in the general grouping; oil for the hair and for use after bathing; phials, hermetically sealed, said to contain otto of rose, and a quack essence in pretty bottles, called "*Balsamica de Harem*," sum up the perfumery articles in the Constantinopolitan Court, and the difference between

what the display might have been and that which it is, is matter for regret. The soap exhibited is wonderfully dear, a small cake costing two francs; but this is, most probably, a detergent used for the bath, and possesses, no doubt, an excess of fatty basis.

In the Egyptian Court powder for tinting the hair and eyebrows, consisting, very likely, of iron and copper; *poudre de henné*, “pour le femmes Arabes;” a cosmetic called *Dilka*, used by the Nubians; and—horror of horrors!—musk of crocodiles, are, in brief, the principal *articles de toilette* to be found in this department; whilst the last named in the catalogue suggests a local colouring somewhat curious—“*pe-ruques que portent les négres de Niams-Niams les jours des fêtes.*”

China declines *in toto*—at least, according to the French catalogue—to subscribe her Celestial sweets to this class; but Tunis sends a few articles, the titles of which appear to have puzzled even the French translators.

America has two exhibitors, one of which displays a pomade made from the inevitable bear, but sublimated into a rarer and more scientific product than those of a similar character by its title “*Ursina.*”

Brazil has a few articles of perfumery not necessary to particularise, though some attempt at arranging specimens of her grand and far-spread flora, from which perfumes could be extracted, would have been welcome; but possibly the Brazilians are satisfied with their imports of foreign scents and odours, France alone having sent 326,350 kilogrammes of perfumery in one year.

Spain has only two exhibitors, one of whom describes a specialty as “*huile anticanitienne!*”

Algeria, as an extensive flower-growing country, is a very important auxiliary to the French trade in perfumery, and some of the exhibitors in the French Court possess large flower farms in that colony, more especially M. Chiris (1), of Grasse, whose plantations at Bouffarik are celebrated for their produce. The articles in this class exhibited in the Algerine Court are redolent of suggestion as to the flowers produced in that part of Africa and manner of treating them for the purposes of commerce; but the subject would trench too largely upon the space allotted to our report, and, for the same reason, a survey and description of some of the articles of perfumery as shown in the English and colonial departments must be rapid and brief.

The English sections consist of a group of small and closely-packed vitrines, and here will be found the names of the most eminent London perfumers.

MR.
WHITING
ON PER-
FUMERY.
—
English
exhibitors.

Mr. Rimmel (12) exhibits the model of a scented jet d'eau in imitation of oxidized silver, and the presiding Naiad will dip your handkerchief as often as conscience will permit into the fountain. The best specimens that can be produced of every description of odour relating to the toilet will here be found, while the lavish generosity with which odours were gratuitously partaken of by the public in former Exhibitions is not likely to be forgotten.

Piesse and Lubin (8) are represented by Mr. Piesse, jun., whose obliging attention and desire to import every information on the subject of perfumery is worthy of special record. Dr. Piesse's untiring efforts to raise the standard of perfumery as an *art* is well known; and the desire which he holds steadily in view is the establishment of flower farms in certain British colonies, so as to make England independent of France and Italy in respect to orange flowers, acacia, rose, and others. At Paramatta, New South Wales, Mr. Holroyd has planted an extensive orangery, and very soon the bergamot and neroli from his estate may be expected in this market.

Mr. Atkinson (1) has arranged his scent bottles and packets *secundum artem* in his glass case; and little need be said as to the class of goods offered by the proprietors of the well-known shop in Bond-street. To the founder of the establishment is due, some half century or more ago, the honour of introducing the pomatum known as "bear's grease" to the British public; while the title, also, of that celebrated composition is due to his fancy and invention.

Mr. Lewis (5) is known in the trade for his good and cheap soap and for his iodine detergent; but the question arises whether every description of soap ought not to owe its excellence to the negative quality of possessing nothing deleterious to the skin rather than to the presence of medicated substances.

Mr. Pears (3) claims the honour of inventing transparent soap which yields a delightful lather, and is at once agreeable to the eye and to the touch. It is made from a mixture of soap and spirits; but the duty on the latter article precludes its being manufactured to any considerable extent in England.

Messrs. Warrick (13) (query, Warwick) exhibit bottles of pickling vinegar and Chili sauce, which must have found their way into Class 25 during the nodding of the Superintendent Jove.

Mr. Gibbs (4) originated the inlaid soap, and is a large importer of that article.

Mr. Price (9) lays claim to having invented a new perfume called "*Lilium auratum*;" and Mr. Perks (6), who brings

scientific research to bear upon his avocation, and is far removed from the vender of articles for the toilet, has brought lavender water to perfection.

MR.
WHITING
ON PER-
FUMERY.

Such are a few of the special objects to be found in the English department, which consists of fifteen exhibitors, all of whom claim, and probably with justice, to deal in articles of great excellence, and in some cases to have given an impulse to the trade by ingenious devices and improvements of all kinds.

In the colonies pieces of dried shrubs and a few bottles are probably the insignia of great commercial progress in the future, and, humble though their appearance, they are perhaps of more real importance to England than the manufactured articles seen elsewhere, notwithstanding the prettiness of their appendages.

British
colonies.

Victoria claims essential oils from the myrtaceous family, the most affluent members thereof being the Eucalyptus and Melaleuca. The oils obtained from these trees are found especially useful in aromatising soap and making good basic odours.

British Guiana boasts its tree "crab-oil," which is highly esteemed by the natives as an oil for the hair, and also a fragrant gum is procurable from the hyawa or incense-tree, which might become an article of commerce for making pastilles.

Such, then, is a rapid and, from many causes, imperfect survey of the position which "perfumery" occupied in the ancient world as cognate to its present aspect; and also of the subject in its modern character, according, as far as possible, to the evidence of the various specimens distributed through the Exhibition building. As a mere display, the innumerable articles included in this class offer much to attract the explorer in the wonderful Paris microcosm—prettiness more than beauty, referable to elegant and ingenious paraphernalia, being their external characteristic; but if the group, in its entirety, is considered as suggestive of or relating to chemistry, industry, taste, and wealth, perfumery, so regarded, becomes of considerable importance, and in this belief, with some difficulties to combat with, the present report has been compiled.

Perfumery
from its
chemical
and indus-
trial aspect
of great
value.

REPORT on LEATHER-WORK, FANCY ARTICLES, and BASKET-WORK.—(Class 26.)—By SYDNEY WHITING, Esq.

MR.
WHITING
ON
LEATHER-
WORK,
&c.

[“Small articles of Fancy Furniture, Liqueur Cases, Glove-boxes, Caskets, &c. Lacquered Articles. Boxes, Jewel-boxes, Dressing-cases, Purses, Pocket-books, Notebooks, Cigar-cases. Turned, Engine-turned, Carved, Engraved Articles in Wood, Ivory, Tortoise-shell, &c. Snuff-boxes, Pipes, Combs and Brushes generally. Fancy Basket-work, Wicker-work for Bottles, and Articles in Fine Straw.”—English Official List.]

MANY of the countless articles exhibited in this class, of which the above list is by no means exhaustive, bear in reference to the solid articles of furniture dispersed through the Exhibition the same relation that the ephemera in the entomological kingdom bear to the bulky specimens of the zoological group; and further, the simile holds good in respect to their evading the grasp of the explorer and being formed in many instances with a view to a very transient existence. Thousands of fanciful and ingenious trifles, under the general term “Articles de Paris,” are scattered everywhere through the building, not only in the especial gallery No. 3, where they are supposed to be exclusively collected, but in out-of-the-way nooks and corners, independent in many instances of an attempt at classification, or more correctly, perhaps, of classification according to the prescribed rules. Notwithstanding, however, the diminutive character of the class as a whole, it is very inclusive in its nature, and embraces articles of exceptional dimensions, such as magnificent dressing-cases, commodious travelling-bags, and other costly impedimenta; while several articles clearly laying claim to the title of furniture have found their way into it from the *mobilier* world, such, for example, as a prie-dieu chair exhibited by Messrs. Duvinage and Harinkouck (88*) and a large cabinet, with faïence plaques, exhibited by Jules Houry (14). Then there are other articles, almost amphibious in their nature, enjoying an existence in two elements—such, for example, as the travelling-bags of Messrs. Howell and James (8), which, by reason of their leather, belong to Class 26, and owing to their gold, silver, gilt, plated, jewelled, and ormoulu fittings, to Class 21. Indeed, in many instances it appears as though the exhibitors had been allowed

Multiplicity
of objects.

Errors in
classifica-
tion.

* These numbers refer to the corresponding numbers in the French Catalogue.

MR.
WHITING
ON
LEATHER-
WORK,
&c.

to exercise their own discretion in classifying their goods, especially in the Holland Court, where pipes are placed in class 17 because of their earthenware pretensions, while, as a rule, they belong to the class under discussion, because they are pre-eminently "fancy" articles and made of a great variety of materials. In the same department, soaps, arranged by the French superintendents in Class 25, were placed in Class 44, because, as the Dutch Commissioner observed, they are pharmaceutical products. In the Italian Court great confusion prevailed in respect to the classification of the smaller articles, and in the Swiss department unimportant objects in carved walnut and other woods were placed in class 3, dedicated to sculpture and dye-sinking!

Reasons for
referring to
errors.

It is possible, by the time this report is published, these errors in arrangement will be rectified; and attention is called to them in accordance with the desire expressed in a memorandum read to a meeting of the British jurors at the office in the Champs Elysées, on April 20, presided over by his Grace the Duke of Marlborough, Lord President, that such notes and remarks should be made.

Information
sought for
in Paris.

Fortunately, in the most important courts, organization and a ready compliance with the rules laid down by the executive prevailed, and permitted a thorough examination of those exhibits (to use a new and convenient word) described in the French catalogue as objects in maroquinerie, tabletterie, and vannerie; and, though they were often locked up in the vitrines, with no one to represent the exhibitor and explain the nature of his goods, a visit to his establishment in Paris usually resulted in every necessary information being cheerfully and politely rendered, not only as referable to the articles exhibited by the Parisians and the French provinces and colonies, but to the generality of the other nations also; for it need scarcely be observed that the industry which Class 26 represents may be said to have taken its rise in the French capital, and that Paris is the centre of its ramifications through the world. Information, therefore, duly sought for in Paris was taking the ewer to the fountain-head.

Descriptio
of "Maro-
quinerie."

"Maroquinerie," so called, is divided into the great and the little—the former including travelling-bags, desks, portefeuilles, &c.; the latter, under the title of "la petite maroquinerie," those innumerable articles such as purses, cardcases, bonbonnières, penholders, and the crowd of little elegancies for the drawing-room or the person impossible and unnecessary to enumerate. They are made chiefly from all sorts of leather dressed in a peculiar way, fancy paper, silk, velvet; brier, rose, and other woods (many of which grow in Algeria); gold, horn, ivory, shell, and every description of metal;

while the machines and tools used in their fabrication form in themselves a curious speciality. This branch of industry—*i. e.*, of maroquinerie—is concentrated chiefly in Paris, in the third arrondissement, and thousands of women and children are employed in the various workshops. The salaries vary from 5 f. to 6 f. for the men, and from 2 f. to 50 c. to 3 f. for the women, while over twelve millions of francs are yearly expended in producing its multitude of articles.

MR.
WHITING
ON
LEATHER
WORK,
&c.

“*Tabletterie*” comprises all those turned articles in ivory and wood used for the handles of umbrellas, parasols, and walking-sticks, and also billiard-balls, combs, tobacco-pipes, the backs of brushes, the common sort of fans, chessmen, dominoes, and an infinity of other articles which may be described, perhaps, as maroquinerie made useful. The great centres of this branch of trade are Paris, Dieppe, Saint Claude (Jura) Beauvais, and many other towns dotted over the entire country, from the Rhine to the Pyrenees. As in the case with the fabrication of maroquinerie the tools used in making the various articles included in the title of *tabletterie* are in many instances quite special, and in an exhaustive report upon the subject would be as worthy of description as the objects themselves. The wages of the men vary from 5 f. to 6 f. per diem, and of the women from 2 f. 50 c. to 3 f. a day. It is worthy of note that many of the fabricators of “*tabletterie*” work at home, and send the various articles which their fancy, invention, and industry produce, either to the shops or on commission for exportation.

Tabletterie.

The word “*vannerie*” includes all the fancy basket-work of the world; and, though a humble branch of industry, comparatively speaking, is a very attractive one; and, while the pliable osier-twigg plays a primitive and simple part in the manufacture, the taste for luxury steps in, and gilds, and paints, and varnishes, till in many cases the original material is lost in ornamentation.

Vannerie.

In the French Court, Class 26 is represented by ninety-three exhibitors, and it is not too much to say that for ingenuity, elegance, and beauty combined with what may be termed small utilities, the articles found in that department are, with some exceptions, superior to any that the world can produce. In the more ambitious leather articles, especially travelling bags and dressing-cases, the Austrians and the English are formidable rivals to the French makers of similar goods. But as it is the province of the reporters on the various classes to describe remarkable objects rather than to offer an opinion as to their various claims to excellence, having in wholesome fear the possibility of running counter to the decisions of the jurors, it will be as well at once to

Elegance of
articles in
the French
Court.

MR.
WHITING
ON
LEATHER-
WORK,
&C.

indicate those exhibits in the various portions of the building most worthy of notice by reason either of their beauty, use, or novelty.

FRANCE AND HER COLONIES.

"Bois
durci."

M. Latry (15) exhibits several elegant articles, called "*bois durci*," which have all the appearance of carved ebony, but which in reality are composed of fine wood dust mixed with the blood of animals. This, however, is in some measure a trade secret which, but for the accident of a previous knowledge of the fact, would not have been communicated by the attendant, who stoutly maintained—doubtless in the belief that it were so—the various objects to be carved in wood, and nothing but wood; but the inventor himself, M. Latry, appearing at the moment, admitted the curious nature of the composition, but was unable, or unwilling, to explain why the employment of blood should impart a black so intense to the articles. It is due, no doubt, to the carbonisation of blood by the action of heat—boiling or baking; and the idea of forming such a material possibly originated from a process patented in England several years ago, by which very fine wood dust and *glue* were made into a substance, dark, hard, and capable of bearing a considerable polish. It is not perhaps generally known that the blood of the slaughter-houses enters largely into the production of the well-known article of commerce called "*Prussian blue*," the chief ingredients in which are prussiate of potash and iron, the former being eliminated from the blood by heat. If, therefore, the blood of animals can help to yield a colour so intense, there is little doubt its excessive carbonisation would give an intense black to the grains of finely powdered wood. The black-pudding makers of Germany and elsewhere scarcely regard the ebon colour of their sausages, &c. made chiefly of blood, from the scientific point of view. A cabinet of this "*bois durci*," with oxydised silver ornaments, a handglass with frame of the same material, and several other specimens, are well worthy of notice, as much for their elegance as for the peculiarity attending this manufacture.

Contribu-
tions.

M. Pingot (91) exhibits a specialty for opening photograph and other books by means of a hinge in the centre of the back, so that, if the binding is in shell, ivory, or other hard substance, the book will open thoroughly and with ease, a desideratum greatly to be desired, so as to present great durability with ease and flexibility in turning over the pages. This exhibitor also shows a novel mouthpiece for cigars,

which screws into the cigar with a small cap to render it firm.

M. Renaudin (27), amongst other novelties, draws attention to cigar-boxes adapted for keeping cigars dry by allowing the air to pass through them—a sort of miniature wine-rack. An *escritoire* made entirely of leather, at least externally, and other important objects in this material, mark a strong desire to extend the leather trade even beyond its ordinary and perhaps legitimate limits; for when we find *jardinières* made of morocco or *cuir de Russie*, an incongruity is at once manifest, inasmuch as the dripping of water and the moisture of the flowers would soon destroy the fine surface of the dressed skin.

M. Tahan (48), who describes himself as “*ébéniste de l'Empereur*,” and whose attractive shop is so well known at the corner of the *Rue de la Paix*, exhibits an *embarras de choix* of fancy articles; and amongst those especially deserving of notice are a *séchoir* for cigars and a coffee-table enamelled in metal.

M. Germain (23) shows many important articles, which stand on the confines of “*tabletterie*” and furniture. His “*objets de fantaisie de laque encrusté de nacre*” are beautiful in the extreme.

Duvinage and Harinkouck (88) exhibit some of the most beautiful objects in the court we are traversing, such as a screen of the time of Louis XIV., with finely painted pictures à la Boucher, representing the four elements; a *priedieu* chair—the one previously mentioned as placed in Class 26, in error—an ingeniously contrived chest containing the implements for all sorts of drawing-room games, chiefly for grown-up children; and especially a beautiful model of the Palace of the Alhambra, at Madrid, made of inlaid metal-work of the finest description. It is about one foot square, and the price is 180*l.*!

M. Alessandrie (40) exhibits a slab or tablet of ivory, which would probably pass unnoticed, but demands attention, owing to the curious process employed in its production. Though the tusk of the elephant often exceeds one foot in diameter at its broadest part, it is also hollow, and therefore precludes the possibility of sections of any size being cut from the most bulky portion, and at the commencement of its solid part only small tablets are procurable. To obtain a large surface from the comparatively smaller part of the tusk seemed an impossibility, till the ingenious idea was started of sawing spirally in concentric rings a longitudinal portion of the solid ivory, and then opening the mass into one sheet. A roll of paper in many convolutions and its

Curious
mode of cut-
ting ivory
slabs.

(MR.
WHITING
ON
LEATHER-
WORK,
&c.
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expansion into a sheet, or a roll of music unfolded for the music stand, familiarly illustrates the *modus operandi*, and the exhibitor shows a specimen in his glass case about $1\frac{1}{2}$ ft. long by 1 ft. broad. Though M. Alessandrie is not the inventor (the process having been patented some years ago by an Englishman named State), he has improved upon the ordinary instruments used in cutting the ivory, and introduced new methods of facilitating its expansion, probably by steam; but the information accorded on this point was second-hand. Such examples of ingenuity show us that we must not only search for the beautiful, but in some cases for the commonplace; and the question arises whether we may not, with propriety, in reference especially to exhibitions, alter the apothegm of Burke and say, "Take care of the useful, the beautiful will take care of itself."

Magnificent
Bible.

M. Cléray (49) exhibits a magnificent Bible, illustrated by Gustave Doré, and which found its way into this group by reason of its exquisite case, consisting of tortoise-shell incrustated with gold. Unfortunately, it is a sealed book to the multitude, the attendant not being furnished with authority to show the interior; but some idea of its costly nature may be gathered by the fact that the price of the volume is 15,000f.—i.e., 600*l.* of English money. This instance again furnishes a proof of how difficult is a strict classification, since the work, from its binding, ought to have been in Class 7, and for its illustrations in one of the fine art divisions; but, owing to its highly decorative exterior, it is placed amongst the exhibits in Class 26, without any description in the French catalogue.

Turbot and Mayer (45) show a very elegant toilet appendage, in the shape of a box of mother-of-pearl, finely engraved; M. Poisson (47) a splendidly carved figure of Christ on the Cross; and M. Gateau (46) various pretty nicknacks in shell and ivory.

M. Hoüry (14) exhibits an ebonised cabinet, with faïence plaques, which ought either to be in Class 14, devoted to fancy furniture, or in Class 17, where porcelain articles are grouped.

M. Diehl (9) exposes a number of small, attractive articles, and especially a box in jet and a cabinet with ornaments *des chiméras*, which he evidently highly esteems, and opens his vitrine to show it with more than usual alacrity and complaisance.

"Nacre."

M. Germain (23) has a number of articles in what we call lacquered-ware, with incrustations of mother-of-pearl, or, as the French term it, of *nacre*. They are showy and attractive, but in no way remarkable for good taste, though the display of colours, owing to the peculiar surface of the

shell decomposing the prismatic hues, is very brilliant. Mother-of-pearl, as well as several other substances, owes its play of colour, not to intrinsic possession, but to its having a series of serrated edges on its surface, and, though seemingly to the naked eye so smooth, these edges are sufficiently defined to be capable of impression on sealing-wax, which latter substance will then partake of the curious iridescence. During the London Exhibition of 1851, papering for a room was shown, made upon this principle, with almost the effect of mother-of-pearl.

Travelling
bags.

M. Aucoc (5) has evidently devoted much of his time and attention to the improvement of travelling appendages of all kinds. A travelling-bag, combining use with elegance, is especially commendable from its peculiar construction, offering a smooth interior for the arrangement of the various impedimenta of Monsieur le Voyageur, and concealing underneath the various toilet necessities.

Carved
ivory.

Such, then, is the result of a survey of the French group of vitrines, so rich in fancy articles of every conceivable form, design, use, and ornament; but in the prescribed limits of this report it would be impossible to refer to every special object deserving of notice, and the appetite for minute description, if indulged in, would become what in physics is termed bulmilia, and must be suppressed at any sacrifice; though it is impossible, before quitting the French department, not to refer to the various beautiful carvings in ivory, and costly meerschaum pipes. In the glass case of M. Moreau (29) is a female figure, and a Christ on the Cross, both marvellous for execution; and MM. Choquet (52) and M. Symon (51) also show exquisite specimens of carved ivory, an elaborate hand-glass frame of the former being a veritable gem for execution and detail. Carved combs and elaborately carved brush-backs also abound in this court, and those exhibited by Messrs. Dumas-Gardeux (58) and M. Margage (79) appear especially excellent for beauty and use. The display of carved pipes in meerschaum, amber, and other materials, though not by many degrees equal to the Austrian display of similar articles, includes many fine specimens both of the material itself and the work of the artist; while brushes of every kind, from the dainty toilet article for the tresses of beauty, down to the coarse and homely brushes for carpets and floors, are not to be passed over without a word as to their excellence. And here it may be remarked, as an instance of the extreme difficulty of grasping, even visually, the different objects in this heterogeneously composed class, in the French Court devoted to jewellery, Class 36, were found pipes, mouthpieces, and other

Errors in
classifica-
tion.

MR.
WHITING
ON
LEATHER-
WORK,
&c.

articles made of a composition so closely resembling amber that none but "the trade" or special tests could detect them as imitations. Now, clearly, these objects belong exclusively to Class 26; and had it not been for an erratic wandering from the prescribed limits in which it was the duty of the reporter to move, it would never have been made known to him that a satellite belonging exclusively to his own system had strayed into space. The same remark holds good in reference to the exhibits of Mr. Baylis (15) in the English department, and to those of Mr. Wormleighton (30) of Birmingham (whose London address in the catalogue must be an error); for the carved wood ornaments of both these exhibitors are in the Architectural Hall; but in these instances the catalogue notes the locality.

Austrian
contribu-
tions.

Next to France, Austria makes the richest display in *articles de luxe* and *fantaisie*, while nothing can excel the beauty of her more solid productions, especially those in leather. Some of these are made of white or cream-coloured Russian leather, inlaid with delicate china flowers, which, with chased ormolu mounts, produce an effect altogether unique. In the glass showcase or shop—for such it almost is, from its size and pretensions—of Auguste Klein (38) will be found some of the most perfect liliputian articles in the Exhibition. The glove-boxes, pincushions, purses, pocket-handkerchief holders, and other articles, in blue, or mauve, or violet coloured silk, with painted flowers, birds, and heads of animals, now so common in the London shops, are a specialty of Austrian industry, and are sold by the gross at a price which bids defiance to competition, and which must enable the retail vender in London and elsewhere to resell at an enormous profit. In gilding and skill in manufacturing delicate fabrics into nicknacks, it is doubtful whether the Viennese artisan does not excel his Parisian rivals; and the fact that the Austrians now produce certain objects of ornamentation and use which they term "*articles de Vienne*," evidently in contradistinction to the "*articles de Paris*," which has become almost a generic name, indirectly shows their desire for competition and a belief in their own power to equal or exceed the skill of other nations. In matters of taste, too, the French must look to their laurels; for it cannot but be remarked that there appears a degeneracy in their choice of what may perhaps be termed small embellishments during the last dozen years. The Austrians, on the contrary, are rapidly advancing in that especial knowledge of colour, form, and harmony, on which so-called "good taste" is based, and which is governed by certain defined and fixed laws as immutable as those of geometry itself.

MR.
WHITING
ON
LEATHER-
WORK,
&c.

Examples of this excellence will be found in the glass case of Rodeck frères (62) of Vienna, whose white leather goods, inlaid with mosaics of coloured leather, are extremely beautiful. The display of meerschaum and amber pipes and mouth-pieces is finer in the Austrian Court than in any other part of the Exhibition; and as a proof of how desirous the manufacturers are of making every possible improvement, regardless of the expenditure of money or time, a small twisted pipe may be seen in the showcase of Herr Cerwak (query, Czerwak) (11), which, made of common clay, would cost about a penny either in England or Austria; but in this instance, from its being made in meerschaum, the price is 100 f. Its specialty is this:—Formerly twisted meerschaum pipes were only partially perforated, that is, perforated only in the shortest of the curves leading from the mouth end to the bowl, whereas the pipe in question is perforated through its entirety by a process which probably destroys many of the specimens before a perfect one is produced; hence, no doubt, the extreme dearness of the article. Meerschaum, though popularly supposed to be made of the froth of the sea, is, in reality, a fine clay, found principally on the coasts of the North Sea, and is composed of hydrate of magnesia combined with silex. It is easily and cheaply imitated, and many excellent specimens of the counterfeit will be found in the Austrian vitrines. There are seventy-nine exhibitors in class 26 in the Austrian Court, representing a very large amount of capital and industry, and, what is worthy of remark, almost all the exhibitors are Viennese, though of course their ramifications extend to almost every part of the Austrian empire.

Curious
pipe.

Berlin does not attempt any great display of *articles de luxe*, though some very pretty objects are distributed in some of the minor German departments. Wurtemberg displays beautiful carvings in ivory, especially a carved picture representing a landscape, and it appears the carved articles of Geislingen, in various materials, have been celebrated for years. The Wurtemberg Commission has published a special catalogue of their goods in the English language, and the contrast is curious between the energy exhibited by the executive in some of the departments and the total seeming indifference to everybody and everything in others. The executive of the Wurtemberg division is an example of the former quality, and they will, doubtless, reap the fruits of their honourable exertions.

Berlin.

The basket-work of Bavaria is pretty, convenient, and light to a degree; and amongst other articles of “vannerie” in her court will be found an important *escritoire*, similar to

Bavaria.

MR.
WHITING
ON
LEATHER-
WORK,
&C.
—
Belgium.

those well-known French ones in mahogany, made entirely, externally, of wickerwork.

Belgium does not call for any very lengthy description of her exhibits in this class, but her brushes, for general excellence, demand a passing word of praise. In this article she appears to excel, especially in the more homely and rougher sort, adapted for domestic and general purposes. A coffee-table, made entirely of brush materials or bristles, seems an objectless production, suggesting an immediate upset to a cup of coffee and an unpleasant association with edibles. Some of those pretty articles so familiar to the frequenters of Spa will be found arranged in the Belgian department, such as purses, mirror-frames, desks, cardcases, *cum multis aliis*. The manufacture and sale of these objects are a source of considerable revenue to the Spa shopkeepers; and the paintings with which they are ornamented give employment to a large number of artisans, men and women. The wood of which they are made is originally quite white, but it is soaked in the mineral waters with which Spa abounds, and becomes of that dusky tint so well adapted as a background to colour.

Italy.

In Italy will be found some beautiful specimens of inlaying in several sorts of Florentine mosaics, together with delicate carvings in ivory, which must have consumed an immense expenditure of artistic skill. A beautiful picture in ivory of Scotti Gaetano is worthy of more than a passing glance; but, as it is removed from Class 26, it is possible it may receive a duplicate word of praise.

Norway.

Norway displays pretty carvings in common woods adapted for knife-handles and other domestic purposes; and Switzerland also sends similar specimens; but, as the attendant in authority insists in placing them in Class 17, and meets expostulation with civil indifference, the natural conclusion is that some special arrangement had been made to lighten for once Class 26, which disdains neither the small nor the great, and includes the maxima and minima with equal powers of containment.

Russia.

Russia, which stands alone for the grandest work of the kind in the Exhibition, perhaps in the world—her marvellous picture in mosaics, where the saintly loveliness of the female heads is only equalled by the devout expression in the faces of the officiating priests—does not excel in the smaller specimens of art, though some of the carvings in cypress wood are specialties. Apostle spoons form a considerable item in the display.

Turkey.

Turkey boasts of 143 exhibitors in this class, but the articles dispersed about seem to be more barbaric than beauti-

ful. Even the pipes—chibouques and nargilis not excepted—were disappointing, though there is little doubt that their peculiar style of metal incrustations and coverings of gold tissue and silk of every hue are highly valued in the harem and elsewhere. One of the characteristics in the productions of semi-barbarous nations seems to be that, while many of their articles of commerce exhibit an exquisite harmony in the materials used, and a choice of colours at once artistic and rare—such, for example, as the Turkish and Persian carpets and Russian cabinets—other objects of industry, affording equal scope for the display of critical taste and sound judgment, astonish by coarseness, gaudiness, and perhaps vulgarity. Of course, it is to be expected that the educated side of a nation should be represented by a high class of manufactures, and its uneducated side by comparatively savage ones; but the wonder is that the artistic productions should be so marvellously artistic, and the barbaric ones so profoundly barbarous.

Algeria, in all those metallic inlayings—or, more correctly, in many instances, in coloured enamels—makes a better display in the streets of Paris than in the building of the Exhibition; and those curious on the subject of the very florid productions of the colony cannot do better than traverse the Rue Rivoli, where the best specimens of Algerine work will be seen. Algeria.

The Indian department is rich in objects grouped in this class. The well-known Agra work, consisting of marble rich with inlayings of jasper and agates, of which costly material the front of the celebrated Taj Mahal is formed, abound; as also “Bombay work,” in sandal and other woods, beautifully carved chessmen, lacquered ware, objects in black wood, carved ornaments in steatite, or soapstone; papier-maché goods; and, above and beyond all for beauty and durability, the perfumed Bidree ware, made of iron, closely and richly inlaid with silver; and specimens from Koftghari, consisting of iron inlaid with gold. India.

The exhibition of leather articles in the English department is extremely good, the exhibitors priding themselves upon using the best materials, and for conscientious work. In several instances, however, the all-prevailing taste for expenditure and luxury have induced a union of durability with great costliness, a specimen of which will be found in the collection of Messrs. Jenner and Knewstub (9), consisting of a shagreen dressing-case, with silver-gilt fittings, the cost of which is 1,000 guineas. Mr. Schafer (14) has invented very ingenious contrivances for making his travelling-bags safe from pilfering fingers, by means of an invisible network England.

MR.
WHITING
ON
LEATHER-
WORK,
&c.

of metal. Mr. Leuchars (12) also displays a magnificent dressing-case, and writing implements in malachite and gilt ornaments, both durable and elegant. Mr. Betjemann (1) claims a specialty for ormoulu ornaments and mediæval mounts. Mr. Greenslade (36) exhibits brushes of all sorts, those for painters being, it is stated, the best the trade can produce.

Ingenuity of
French
articles;
durability of
English
articles.

There are 42 English exhibitors in this class, and a general survey of their goods conveys a very forcible impression as to the position they occupy as manufacturers of what is termed "first-class articles." For ingenuity and finesse in matters of detail, and for a talent in producing articles that shall please the eye rather than satisfy the judgment, the English cannot compete with their foreign rivals; but for solidity and qualities that promise, perhaps, a lifetime of wear and tear, our countrymen are unequalled. It were trite to observe that in the purchase of gilt ornaments the buyer is at the mercy of the vender, for the art of gilding has become so wonderfully delicate that an inconceivably small amount of gold or silver may be deposited on an article, causing it to resemble solid metal, but which in a few days even the action of the atmosphere, unless very pure, or the moisture of the hand will destroy. A well gilt article cannot, by reason of the quantity of the precious metal consumed, be sold at a low price, and it is only in the first-class shops, the proprietors of which are responsible to a clientèle, that it is safe to purchase gilt or silvered ornaments for the toilet or the table. Many of the items in Class 26 are worthy of existence in the rarer region of the fine arts, by reason of the delicate skill and elaborate work which have produced them, such as some of the carvings in ivory and a few of the paintings; but these are exceptional, and, as a whole, the word "prettiness" best expresses their character; and though in a liliputian world so extensive "the beautiful" is occasionally met with, the instances are few and far between.

REPORT on JEWELLERY and PRECIOUS STONES.—(Class 36.)—By N. STORY MASKELYNE, Esq.

MR. MASKELYNE
ON JEWELLERY,
&c.

THE French terms under which the objects ascribed to Class 36 are included do not admit of being readily translated into our language. We imply by the term jewellery not only what in France is understood as “*joaillerie*,” but also much of what would be there called “*bijouterie*.” The former term expresses a class of personal ornament, in which precious stones, faceted or “*en cabochon*,” or pearls, form the principal feature—the precious metals forming little else than the groundwork for retaining and exhibiting the stones. The *bijou* is essentially an ornament in gold or silver, wherein precious stones are but ancillary to the metal, or whereon enamel is more or less liberally used as an enrichment.

Subjects of
the class.

The wide distinction drawn by the French Commission between “*joaillerie*” and “*bijouterie*” on the one hand, and “*orfèvrerie*” on the other, which are placed in different groups, appears the more arbitrary to an Englishman from the circumstance that our jewellers and goldsmiths almost invariably form a united trade. A logical division, however, even with the use of the French terms, is not very easily made between some of the more delicate enamelled plate of the *orfèvre* and the bolder forms assumed by the work of the *bijoutier*.

The reporter purposes to review separately the objects of this class under their two French divisions, and will venture to use the term *bijouterie* as an English word.

Jewellery,
its divisions.

The following is a summary of the objects comprehended under the two several terms:—

I. JEWELLERY.—The first division of the objects of this class will include (1) Fine jewellery; the productions of the jeweller’s art in its highest form; ornaments—namely, for the person, such as the tiara, the necklace, bracelet, earring, brooch, and ring. They are almost exclusively wrought in diamonds or pearls, or in these mingled with the more valuable precious stones—namely, the ruby, the sapphire, the emerald, the spinel, the opal, and occasionally the turquoise.

(2.) In this class the Commissioners have further placed objects illustrative of the trade in precious stones, including what are, strictly speaking, mineralogical collections of such stones, showing them in their natural forms, as crystals, &c.,

MR. MAS-
KELYNE
N JEWEL-
LERY,
&C.

or in the various stages of their progress through the hands of the lapidary.

(3.) There are also included certain forms of inferior or cheaper jewellery that are more or less local, such as the garnet ornaments peculiar to Bohemia; works fashioned for ornament in other semi-precious materials, such as coral, amber, jet, &c.; which usually represent a limited and local industry, or one devoted to the supply of particular markets.

(4.) The class also embraces imitations of pearls and precious stones in glass, including that highly refractive and hard variety of glass known as trass or paste.

Bijouterie,
its divisions.

II.—BIJOUTERY.—The bijou, or trinket, presents considerable variety as well in form as in material. Under the term will be included (1) works in gold or silver, whether designed for the adornment of the person or for the smaller and more portable kinds of quasi-personal ornament adapted for the cabinet or the toilet table. Bijouterie of this higher class owes its value in part to the precious metal of which it is made; but a large and, of course, very variable proportion of that value is due to the precious and semi-precious stones or pearls with which it usually is enriched; frequently, also, it is greatly enhanced by the artistic introduction of enamel, or by other expensive forms of skilled labour, such as that of the chaser on the precious metal or of the engraver in *pietra-dura*, whose works, as cameos, are happily becoming a much desiderated species of ornament.

The stones used for the enrichment of this division of the class are very varied in their character. Besides the most precious stones and turquoise, we see the beryl, chrysoberyl, amethyst, topaz, garnet, as well the pyrope, as the almandine, and the "Bohemian" kinds; chalcedony, including the "Oriental" varieties of onyx, agate, and sardonyx; and the softer or cornelian varieties, known as German onyx.

(2.) We must, however, be careful to recognise a distinction between the *fine* bijouterie, wherein material and workmanship are enriched by the best efforts of the designer and of the artizan, and a *second-class* bijouterie, only slightly less rich in its material, but on which the more expensive forms of labour have not been equally lavished. The second-class bijouterie is usually an industry of particular localities, supplying special or local markets or devoted to an export trade. Besides these works in fine gold and silver included in the second of the above divisions of bijouterie, we have a great variety of cheap productions, of enormous industrial importance, fashioned in materials on which the precious metals are so applied as to form a comparatively small item in the cost, and set with stones of minor importance in the eyes of the

jewellers, such as garnets, chrysoberyls, amethysts, &c. These are essentially what we may denote by the English term, trinkets. They are—(3) ornaments in copper, plated with gold, or *doublé*, an industry of great importance in France; (4) ornaments in copper gilt, whether by voltaic deposition or by mercurial processes, often set with artificial imitations of precious stones; and, finally (5), ornaments in steel, which form an important industry in Paris.

MR. MASKELYNE
ON JEWELLERY,
&c.
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1.—JEWELLERY.

Jewellery.

To this division of this class France and England are the largest contributors, as well in wealth of material as in excellence of design. Russia, conspicuous on other occasions for her jewellery and on this occasion in so many other forms of artistic industry, is only represented in the Champ de Mars by some exquisite works of the house of M. Tchitchileff, of Moscow. Other countries, that make a considerable exhibition under the head of bijouterie, show little under this head.

National
character-
istics.

London jewellery, in accordance with English tastes in general, is wont to exhibit a certain solidity and substantial massiveness as an essential quality. For, while the English jewellers are justly celebrated for the careful selection of the diamonds and precious stones with which they compose their works, they are not less conspicuous for the firm and admirable workmanship of the settings in which they secure them.

An almost fabulous wealth of precious stones may be seen in the cases of the French jewellers; but for a fine selection of well-matched stones—in admiring which one almost forgets the costliness and choiceness of each single diamond, emerald, or pearl, as one surveys the perfection of the whole—the jewellery exhibited by the Countess of Dudley, in the case of Messrs. Hunt and Roskell, stands alone.

The characteristics of French jewellery, on the other hand, are of a very opposite character. Aiming at lightness of effect and at concealing the difficulty of giving the precious stones of a parure sufficiently strong mountings without surrendering something of grace and elegance, the Parisian jeweller has too often sacrificed to the promptings of taste the firmness and rigidity that security requires.

The difficulty of the jeweller's task is at once seen when it is borne in mind that the precious stones of a piece of jewellery are, in fact, let into small cells cut for each individual stone out of a solid plate of silver or gold. Furthermore, the stones, when inserted into these, have to be so secured that the portion of the edge of the stone held by, and therefore

Designs for
fine jewel-
lery.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.
—

concealed in, the setting may be the least possible consistently with the setting having a firm hold on the stone. Therefore, in the choice of designs for a piece of jewellery security would bid us select such as do not demand an extraordinary delicacy of substance: yet the charm of the precious stone is brilliancy and colour and moving light, and it cannot be set to advantage in forms that suggest the idea of weight. Hence the great difficulty consists in avoiding a massiveness that looks ponderous or an ornateness that may become vulgar in taste and cause insecurity.

It is in the various forms assumed by the tiara—the ornament, of all others, the best adapted for the diamond—that these difficulties have been perhaps most often and most completely overcome.

In a necklace, for instance, the English jeweller, wishing to take nothing from the resplendent effect of a single row of large diamonds, prefers to set such stones in simple juxtaposition; while the French jeweller would naturally seek to set them off with a design, or surround them with a hundred satellites of minor diamonds.

Another fashion, much followed in French jewellery, seeks to represent in diamond-work the graceful curves and delicate forms of the vegetable world. And this is a dangerous path, one footstep out of which may plunge the artist who follows it into bad taste; while, if he advance along it too timidly, he will surely leave evidence on his work of that intractability of his materials which it is his object to conceal or conquer.

M. Massin's
works.

Yet how beautifully an artist can work in this difficult line may be seen by looking into the case of M. Massin. There a sprig of wild rose, presenting the lightness, the elasticity of curve, the very crispness of leaf and flower of the natural spray, is perhaps the most beautiful example ever wrought in this kind of representation of a vegetable form. One more leaf, or a more voluptuous bend to the stem would not have taken from its truth to the natural spray, but it would have spoilt its simplicity and symmetry as an ornament. Those who had believed that work in diamonds was incapable of entirely throwing off a sort of barbarism natural to it, or of rising to the dignity of a fine art, must at least feel that, in spite of an inherent incongruity of material, such forms of jewellery can become competent to express the grace of Nature, albeit in a language and a poetry of their own. A pair of earrings shaped as rosebuds, whereof the bud is a pink pearl, are an exquisite adjunct to a parure of similar treatment representing a rose-branch; while a charmingly-rendered water-lily and a cornflower of sapphires and diamonds

may further be pointed to as lovely specimens of M. Massin's handling of the forms of nature.

The international jury inspected the mountings of these delicate works with a jealous scrutiny, to satisfy themselves that the charm of their lightness had not been attained by a sacrifice of the requisite rigidity and strength in the metal-work. The different hues of flower and leaf are indicated rather than expressed by M. Massin by the use of gold for the mountings differently alloyed with copper or with silver—the “red” or the “green” gold of the jeweller.

But, however exquisite the taste in which these floral forms are executed, and however firm their settings in these special instances, such ornaments must be looked on as exceptional, and are hardly to be held up as examples for imitation. Less lightly designed forms of this kind must fail in artistic effect; while designs as light will, in less cautious or less able hands, become dangerous to the safety of the stones. While, therefore, we pay the tribute of admiration to M. Massin's beautiful works, which are for the most part designed for an Oriental market, we must look for practical purposes to forms less ambitious in their aim as regards lightness of design.

For such we may go to the cases of M. Mellério, M. Boucheron, or M. Rouvenat, among the jewellers of France; or, again, in those of Mr. Hancock or Mr. Emanuel, in England, or of Mr. Goldschmidt of Frankfort and Mr. Goldschmidt of Vienna, we may find excellent examples of the more solid varieties of design and workmanship.

Works of
other
houses.

A diadem of diamonds in the Hispano-Italian style of the age of Henri II. may be taken as a good sample of the elegance and taste, while a branch of white lilac in diamonds (ingeniously rendered, though much too ponderous in effect) reflects credit on the technical processes practised by the great commercial establishment of M. Rouvenat.

M. Mellério, conspicuous for the wealth of his materials, and no less for the refinement and taste of his designs, exhibits a beautiful convolvulus ornament, with pale cabochan emeralds, a Greek diadem in brilliants and briolets of diamond, each admirable in character and finish; while the precious stones in his case are some of them literally too vast to be beautiful. Such is a sapphire of 400 carats weight, and a parure of vast stones to match with it, of the value of some 25,000*l.* to 30,000*l.* One emerald, also, of 25 carats, is of exquisite colour. He also shows a paper-weight, in the form of a sphinx, cut from a single garnet of vast size, and hooded with a mane of diamonds.

M. Boucheron, again, exhibits much originality in several

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

diamond ornaments especially remarkable for the great movement of their different parts, and for their admirable rendering of the *genre de Paris*. Among them may be mentioned a necklace, with cameos of Imperial heads in the style of Louis XVI.

The emerald parure and a necklace with emeralds in the case of Mr. Hancock, or again, a parure with pearls and little shells of incrustated turquoise (although, perhaps, rather an object of bijouterie), may be mentioned among the excellent and well-finished works exhibited by this celebrated English jeweller.

Mr. Emanuel's case possesses an importance, for it serves, in the absence of some of the leading English houses from the Exhibition, to show that an established reputation and the wealth it brings need not induce indifference to progress in taste. Some two or three of the greatest and longest established French houses do not seem equally progressive. Their work is excellent, and the taste it displays good; but, content with success achieved, they have won little credit for progress in design since the epoch of 1862.

Mr. Maurice Goldschmidt, of Frankfort, exhibits a sprig of geranium in diamonds, set in the substantial and sound manner of English jewellery, and not wanting in the natural grace of the plant imitated. In the case of Mr. Michael Goldschmidt of Vienna and Prague, we see specimens of some of the best and most costly jewellery manufactured in Germany. A sort of tiara in diamonds and silver, representing geraniums and roses with leaves, is a good specimen of the Vienna manner of mounting.

Precious
stones.

There is no doubt much yet to be done in design for the treatment of diamonds and the more costly precious stones. Geometrical forms seem to be more adapted for this style of jewellery than are the floral and other natural objects that the jeweller is so fond of imitating. An aigrette, indeed, in the case of M. Massin, bends with all the grace of the feather, yet not too much for the maintenance of a singular dignity. But this, like that artist's other works, is exceptional; and, on the other hand, we must cite the many humming-birds in the French vitrines, so delicately and ingeniously wrought in diamonds and coloured stones, or the peacock's tail feather, similarly rendered in the case of M. Melléro, as works to be admired, indeed, as pretty conceits which a temporary fashion seems to have called into being, but which, even in the hands of these masters of the art, cannot aspire to imitating the ubiquitously changing colours, or even the delicate form, of the bird itself. The magnificence and wealth of precious stones so attractively seen, and

often so superbly mounted, in the cases of M. Bapst, with his priceless emeralds; or of M. Mellério, with the vast sapphires already alluded to, and which have adorned the cases of English or of French jewellers in former Exhibitions since 1851; or, again, the almost regal jewels of the Princesse Duchesse de Mouchy, to be seen in the case of M. Lemoine, must attract every eye, if, indeed, they do not tend to take from smaller specimens of these precious materials something of that fascination and that artificial value with which an old-world custom and a world-wide fashion have invested them. The jury, however, had to deal only with the mountings of such jewels, or with the taste displayed in the association of the stones themselves. On this ground Messrs. Hunt and Roskell have received recognition for the fine suites of stones from the jewel-cases of Dudley House; and Mr. Thomas, of Oxford Street, for the isolated stones and for the train of diamonds his judgment has formed. The splendour of the Exhibition bears witness to the commercial importance of the many houses, French and English, that display such stones; but the awards of the jury were entirely unaffected by that splendour.

Included with the objects appropriated to this class are the illustrations of the processes whereby precious stones or their artificial imitations are wrought. The exhibitions of such objects labour necessarily under a disadvantage in being thus brought into competition with industries with which they have nothing in common. They belong, rather, to those departments of the Exhibition which deal with the productions of mining industry and their manufacture. Thus, while novelty of design and improvements in processes of manipulation or the manual execution of gold and silver mountings and enamels form the criteria by which a jury has to decide on the merits of exhibitors in a class, how are these tests to be applied to the now ancient, and of late but little improved art of diamond-cutting, and how is the unique exhibition of M. Coster to find in such a class a place worthy of its commercial importance and scientific novelty? As it is certainly one of the most interesting spectacles in the Champ de Mars, the reporter would endeavour to call attention to its merits.

In a part of the park contiguous to the Netherland section M. Coster of Amsterdam has erected a building wherein all the processes of diamond-cutting are carried on.

The first rough shaping of the more important facets of the brilliant is here seen performed by the workman, who operates on two diamonds at once, by bruising each against the other, angle against angle. The dust that falls from

MR. MASKELYNE
ON JEWELLERY,
&c.
—

M. Coster's
diamond
cutting.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.
—

the stones is preserved for the subsequent processes of grinding and of polishing those facets that distinguish the many-sided "brilliant" from the dull original crystal of diamond. It is used, mingled with oil, on a flat iron disc, set revolving with vast rapidity by steam power; the stone being held upon this disc or wheel by a tool to which it is attached by a mass of a fusible metallic alloy, into which the stone is skilfully inserted. Skill of eye and hand, only attainable by great practice, is needed for this work. But a skill not less exact is needed for another process, which may here be seen in daily operation—the process of cleavage. The diamond, when a blow is struck on an edged tool placed parallel to one of the octahedral faces of the crystal, readily splits in that direction. But to recognise the precise direction on the complex and generally rounded form of the diamond-crystal; to cut a little notch by means of a knife-edge of diamond formed of one of the slices cleaved from a crystal, and to cut that notch exactly at the right spot; then to plant the steel knife that is to split the diamond precisely in the right position; finally, with a smart blow to effect the cleavage, so as to separate neither too large nor too small a portion of the stone, these various steps in the process need great skill and judgment, and present to the observer the interesting spectacle which a handicraft dependant on experience of hand and eye always affords. But M. Coster's exhibition has other objects of interest. For the first time we may see here the diamond side by side with the minerals that accompany it in the river-beds of Brazil; and there are even examples in which crystals of diamond are included within a mass of quartz-crystals, which have all the appearance of having been formed simultaneously with the deposit of the diamond.

The different districts of Rio and of Bahia are thus represented, the former producing a confusedly crystallised sort of diamond termed boart, and the latter an opaque black variety; both these kinds being found associated with the crystallised diamonds used for jewellery. Though useful in the state of powder, the boart and black carbon are incapable of being cut as a jewel.

M. Coster's
exhibition.

In M. Coster's cases the sands and pebbles of each district are sorted and exhibited in association with the diamonds actually found in and picked out of them. From these, M. des Cloiseaux, the French mineralogist, together with the reporter, selected crystals, unknown before in Brazil, including tin-ore and the mineral brookite.

M. Coster also exhibits a most choice and interesting collection of diamond-crystals, and a series of cut diamonds

representing the weight of a carat from the brilliant of a single carat down through the various stages of two, of four, &c. to 1,000 cut stones to the carat. The carat is a very ancient weight, slightly varying at different times and places, but in England equivalent to 3.17 troy grains. It consists of four carat grains, which are, therefore, equal each to 0.792 troy grain.

MR. MASKELYNE
ON JEWELLERY,
&c.

M. Coster also shows some fine coloured diamonds, including that greatest of rarities, a transcendent blue one; and he exhibited to the jury a rose-pink diamond of some 29 carats, endowed with the extraordinary property of becoming perfectly bleached by an exposure of some four minutes to ordinary daylight. It recovers its rose colour at a gentle heat, and retains it for any length of time in darkness.

Among the curiosities in this building must be mentioned a minute intaglio, a portrait of the Emperor Napoleon III., cut by one of the workmen of M. Coster, of the name of Vries. The compact little establishment in the *parc* of the Champ de Mars is an epitome, in very modest dimensions, of M. Coster's manufactory at Amsterdam, where some 316 lapidaries, assistants, and apprentices, with some eighty-eight cutters and twenty-one splitters (for cleaving the crystals), form an aggregate of 425 workmen employed in this important industry, and receiving from 1,000*l.* to 1,200*l.* per week in wages. M. Coster has recently substituted female labour for that of men, training the hands of young girls to the delicate adjustments needed for these processes.

When we consider that an average of some 176,000 carats of diamond (equivalent to 800 avoirdupois and nearly 1,000 troy pounds), exclusive of a few parcels coming by private hands, has been the annual importation for the years 1862–6 inclusive, and that of these M. Coster has himself received nearly the half, the importance of his great establishment may be estimated. For the finer varieties of diamond, averaging in weight under half a carat, a price equivalent to 10*l.* or 11*l.* a carat is now paid; and the price has doubled since 1848, at which date 4*l.* 8*s.* or 5*l.* would have purchased diamonds for which 10*l.* or 11*l.* have to be paid now. Thus, a diamond of 2 carats weight, worth then some 30*l.*, is now worth from 60*l.* to 70*l.*, and sometimes more; while a perfect brilliant of 4 carats is now worth from 200*l.* to 300*l.* When Jeffries wrote his book on the diamond, a century and a half ago, a carat diamond, now worth about 17*l.*, was valued at 8*l.* Such are the fluctuations of this singular trade.

M. Coster has cut two out of the three great existing brilliants—namely, the Koh-i-Noor, of some 103 carats, and

MR. MAS-
KELYNE
ON JEWEL-
LERY
&C.
—

the Star of the South, a Brazilian stone, slightly brown in hue, of 125 carats. The third, known as the Pitt or Regent diamond, the well-known crown jewel of France, weights 135 carats, and was cut in the last century. For the cutting of the Star of the South M. Halphen, its owner, and by implication M. Coster, who really cut it, received the gold medal of 1862. M. Coster's exhibition in 1867 will bear out his reputation, and give it a new character; for, apart from its general interest for all, it possesses a sterling scientific value.

Illustrative
collections
of precious
stones.

Russian.

A complete and well-chosen collection of the minerals employed in jewellery, as well in their natural crystalline forms as in their cut state, is exhibited by Mr. Gregory, of Russell-street, Covent-garden; and in the Prussian section we see the great industry of Oberstein in cutting and colouring agates admirably illustrated by several of the Oldenburg manufacturers. Nor must mention be omitted of the magnificent opals exhibited by Herr Emil Goldschmidt, of Hietzing, in Lower Austria—vast in their magnitude, and accompanied by the different varieties of the trachytic breccia and filamentary quartz with which they occur. Russia exhibits a series of cut stones, some of which are interesting as being minerals hitherto unused, or rarely used, for jewellery. Among them are phenakites, with the lustre and clearness of the beryl; some of which, of a fine brown when they were first exhibited in Paris, have become perfectly colourless by exposure to the light. Cut specimens of sphene, beryl, rubellite, alexandrite, and other Siberian stones, including the emerald and sapphire, are with these. Australia also, thanks to the zeal and painstaking of Dr. Bleasdale, of Melbourne, sends some very interesting crystals and cut stones of sapphire, topaz, zircon, and even a noble opal, vieing with the products of Hungary in its play of colour.

Australia.

Imitations.

Of the imitations of precious stones and pearls, which form an industry of considerable importance in France, we have very admirable illustrations. Thin glass beads, varied in tint and form to imitate the varieties of pearl, lined with the scales of the fish termed the *ablette* and then filled with wax, may be seen in strings rivalling the pearls beside them in the case of Messrs. Constant and Valet; while the black pearls of M. Topart are a specialty of his firm, and cannot be surpassed. The imitations of the diamond and emerald, and in some cases of the sapphire and ruby, in the case of M. Savary, are excellent. The turquoise also is imitated in a species of composition containing plaster of Paris, by a M. Lebert, in his "genre Egyptien," but not with much effect.

The artistic and archæologically-meritorious stage dresses and other decorations exhibited by M. Leblanc Granger, are an admirable illustration of a very legitimate use for these artificial materials; but there is a very large commerce in these imitations for the adorning of the actors in other scenes than those of the theatre.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.
—

There remain to be considered under the head of jewellery a number of local industries, devoted in general to the preparation of materials only met with in the particular localities where those industries are seated. Such are the garnet ornaments, generally composed of densely-clustered cut stones, mounted in gold of a very low standard, and fashioned in large numbers in Bohemia and Hungary. There is an export trade in them of some magnitude, chiefly carried on with the United States. The material is, when well chosen, very beautiful; for, in its deep, rich colour and splendid lustre, the despised Bohemian garnet yields to scarcely any of the coloured precious stones. On the other hand, from the depth of its colour, its effect is frequently too black. There does not seem to have been much novelty introduced of late years into the designs employed in this industry.

Local in-
dustries in
jewellery.

Coral, again, is another semi-precious substance, capable of being very effective as an ornament. Mr. Phillips, of Cockspur Street, maintains his well-earned reputation as a sort of monopolist of the finest as well as the rarest and most delicately tinted coral. Many of Mr. Phillips's smaller ornaments in coral are wrought with fine taste in association with enamel and pearls. It is, however, a material far better adapted for simple and massive, or otherwise plain, ornament than for the elaborate carving which has at times been lavished on it, and for which it is precluded by its softness and its brittleness from being a very appropriate vehicle.

Coral.

A similar remark holds good for a still more fragile and not less beautiful substance, the fossil gum-resin amber. In archaic times it ranked with gold in value, and it is perhaps the most venerable material for ornament of all that are in modern use. Unfortunately, it is difficult to distinguish it from other resins of the copal and anime kinds; and a M. Belladina, of Marseilles, even boasts of supplying in large quantities such spurious imitations of the true Baltic fossil as well as of coral. Very fine necklaces of true amber beads are shown by Mr. Milke, of Worms, and by several other German and Danish exhibitors.

Amber;

The jet of Whitby also finds a place among these local and less important forms of jewellery. The exhibition of these objects was unfortunately not as complete as it would have been had not some of the cases containing them failed

Jet.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

to reach Paris. It is, however, a material eminently fitted by its black colour for the purposes of mourning, while a soft lustre gives it a preference over the favourite Irish ornaments in bog oak on the one hand and the imitations of jet in black glass, with their vitreous glare, on the other. Here, too, simple designs aided by very careful finish and accurate cutting of the forms seem to be especially suggested by the nature of the material. Jet has been rather successfully imitated in the compound of caoutchouc and sulphur, termed ebonite; and again in a powder of wood, blackened, moulded, and then hardened by a process belonging to Mdme. Gagné. The latter is prettily employed for ornaments, representing cameo-like heads and bas-reliefs.

The Scotch jewellery, or, more properly, bijouterie wherein silver ornaments rude and almost barbaric in fashion are set off, occasionally with a variety of yellow quartz found at Cairngorm, but far more frequently with the yellow amethysts from Brazil, or inlaid with jaspers and agates often from Scotch localities, may be mentioned here, as forming a very local industry, incapable of much development. Messrs. Marshall and Co. have striven, by very careful work, and by attempts at refining the taste in these articles, to improve and elevate their character. Unfortunately, the very barbarism of such a species of ornament is almost its only claim for recognition. Messrs. Crouch and Son, on the other hand, have contented themselves with reproducing these Scotch ornaments with excellent workmanship and with only very slight modifications of the character of their design. In doing this they seem to have worked more in harmony with the quasi national sentiment, which lends a significance to this particular fashion of personal adornment.

II.—BIJOUTERY.

Bijouterie.

If jewellery, in the restricted sense of the word, be confined to one side, as it were, of the arts of the goldsmith-jeweller, bijouterie, on the other hand, embraces every side of those arts, including even some forms of jewellery itself; for the bijou represents every kind of fine ornamental work calculated by the minuteness of its size for the exhibition of delicate detail. The treatment of gold and silver by every process that imparts form, whether by casting, filing, soldering, hammering, filigree, or engraving; the mounting of precious stones; the difficult art of enamelling; the skill of the cameo cutter—these all have to be taken in hand by the bijoutier, for all contribute to his results, yet each is, as it were, an art by itself.

This great industry, which in France represents annually above 300,000,000*f.*, whereof some 20,000,000*f.* are represented in the Exhibition, has made great progress during the last fifteen years, for the division of labour has facilitated the processes by hand-manufacture of the superior kinds of work, as, for instance, in the case of gold chains, while inferior kinds of manufacture have been cheapened by improvements in machinery. And the progress in taste, as applied more particularly to the bijouterie of the less costly kinds, has also been marked, not in France only, but in England and other countries.

MR. MASKELYNE
ON JEWELLERY,
&c.

Without entering systematically on the history and progress of various forms of the bijoutier's art, we may select some points of especial interest among them suggested by the more successful works exhibited in Paris. The objects exhibited by M. Duron claim the first place among these on account of the admirable skill with which enamel the most delicate, and gold work of the finest modelling and microscopic finish, have been wedded to vases of rare materials, such as of agate, lapis lazuli, or crystal, some of them being cut by M. Duron himself; while others are antique or of cinque-cento date, and frequently fragmentary. Indeed, this artist exhibits a mastery over each and all of these important and delicate arts such as we have been accustomed to associate with the great goldsmith artists of earlier centuries. The mode in which the material of an incomplete vase is imitated in the enamel foot or neck that has been added to complete it or improve its form, or the skill with which restoration of lost parts has been supplied in the crystal material of the original, and the tasteful manner in which additions have been made in the form of handles or of bands that serve at once for ornament and support, leave little to be achieved in this style of bijouterie. Of M. Fontenay's adaptations of classical and Renaissance ideas to forms of bijouterie harmonizing with modern tastes we shall speak again. But this artist has introduced green jade into some of his works in a manner that is novel and occasionally effective, and that has the merit, in some cases at least, of avoiding the clumsiness which so hard and heavy a material has a tendency to impart. A pair of earrings in the form of an amphora, with golden handles and ornaments, is a charming illustration of M. Fontenay's taste; while a gold brooch with a motto inculcating the three Christian virtues may be selected as an example of the character of his design, and exhibits the admirable colour M. Fontenay imparts to his gold.

Fine bijouterie.
M. Duron works.

Works of
M. Fontenay

M. Rouvenat, again, whose works in jewellery have been

and of M.
Rouvenat.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

already alluded to, exhibits much that is excellent in taste and workmanship as fine bijouterie. But he furthermore lays a just claim to a very important place in the Exhibition on account of the commerce of his house, not only in the production of jewellery and bijouterie of the higher class, but of bijouterie generally of every kind, and on the most extensive scale. At once an artist and a large manufacturer, M. Rouvenat has arranged his ateliers so admirably that they form a model establishment. Thus his workshops, where roofed with glass, are kept cool in the hottest sun by a screen of water flowing in a thin sheetlike cascade over the glazed roof; and other arrangements on the establishment are equally well contrived and efficacious. One can hardly fail to attribute something of his success to the spirit in which the interests of his workmen have been considered by him.

Enamel.

The increasing employment of enamel and of cameos cut on onyx and sardonyx may be said to give a character to the bijouterie of the Exhibition of 1867. Large surfaces of metal covered so successfully, as far as regards the manipulatory process, by M. Baugrand, with rich enamel, in a figure representing a priestess of Isis, and in a great coffer intended to imitate Egyptian form and details, conspicuously illustrate the command obtained, as well in colour as in technique, over this difficult art; while a little gold enamelled casket in cinque-cento style, in the vitrine of the same distinguished jeweller, is a very effective specimen of rich and tasteful handling of form and material.

Transparent
enamel.

M. Boucheron, amid many elegant examples of jewellery notable for the bold use of coloured stones and for the great movement of their mountings, and remarkable also for the finely-cut and cleanly-finished pierced ornaments in the red-hued alloy of (18-carat) gold and copper, shows also a hand-mirror into the border of which transparent enamel has been introduced with excellent effect when the mirror is held to the light. The back of the mirror is also gorgeously enamelled with a similar material; and one has only to desire that the design of the whole had been somewhat more elegant in outline.

M. Mell  rio has substituted for enamel a delicate mosaic work in some of his specimens of bijouterie.

Mr. Phillips
and other
artists in
enamel.

The command over enamel which Mr. Phillips, of Cockspur Street, exhibits in some of his ornaments is very complete. For quality of colour and for taste in its association, some of his necklaces and the mountings of two or three crystal bowls are remarkable works. The scarab  us necklaces in the Egyptian manner, but enamelled in very vivid

hues, if in a style that is rarely beautiful, are, however, admirable in their rendering of its rich effect. The colour of Mr. Phillips's gold is unsurpassed by any in this class.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.

Mr. Emanuel also maintains the character of English bijouterie in its treatment of enamel by some excellent examples of it in pretty and rather novel modes of handling.

The great works of M. Lepec, so rich and so tasteful in the disposition of the enamel that covers them, have been placed in the class of *orfèvrerie*, and are thus removed from comparison with the objects of enamel in the class of bijouterie, to which some of them seem more naturally to belong.

There, are, however, a few novelties in the processes and treatment of enamel in minor forms of bijouterie that need still to be noticed.

M. Delarue, in the Palais Royal, employs a process of partial enamelling in portions of a surface of gold which have been previously engraved. The first coating of enamel is white, in slight relief, and on this coloured enamels are applied; and, finally, the whole is polished.

M. Cadet Picard shows a case of ingeniously-modelled and delicately wrought and enamelled little objects, to some of which a grotesque life is imparted by a voltaic arrangement concealed in a portable form of galvanic cell.

The case of Messrs. Brocard and Mainfroy is, however, pre-eminent for the admirable individuality and ingenuity of the works contained in it. These consist in little bagatelles of gold—tortoises, insects, &c.—if not pretty, at least wonderfully imitated from the life in the enamel of their surface.

M. Villeret also, who exhibits some cameos excellent for the taste of their mountings, has somewhat similar little ornaments, such as foxes' heads, &c., carefully modelled in silver, and covered with an enamel-like coloured varnish that is effective.

Some very prettily-designed and minutely-finished bijou ornaments, exhibited by Messrs. Pavillet and Pavie, may also find mention here; for they represent a style of work that seems to be *sui generis*, both on account of the minuteness of its treatment and the comparatively low cost at which it is produced. The ornaments of the age of Louis XVI. form the types on which they are designed; and if in their effect they are—to an English eye, at least—too microscopic and elaborate in the detail, the enamel and the gold, on the other hand, exhibit taste in their colours and treatment. One little necklace, ornamented with pearls, and with minute Cupids richly enamelled, is an excellent example of the style.

Messrs.
Pavillet and
Pavie.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.

The antique
school.

Signor
Castellani.

These pretty and economical little bijoux command a considerable sale.

We have thus far considered a few individual instances of excellence in the manufacture, chiefly, of fine bijouterie of various kinds. But one large and important section of this class in the Exhibition demands a review in connection with such names as those of Castellani, Phillips, and Casalta. We may, however, better describe under the title of the "School of Castellani" the efforts made by that famous goldsmith and his followers to revert to the earlier ages of the art, in order to draw from the pure fountain of classical precedent designs that might fulfil the wants and suit the tastes of modern civilization, and at the same time present a finish in their workmanship worthy of the arts of our age. This enthusiastic Italian goldworker has reproduced, with a fidelity as fine as his processes are delicate, the golden ornaments that archæology has ransacked from amid the tombs wherein Etruscan, Greek, and Roman civilization lies buried. In the Exhibition of 1862, M. Castellani's case attracted general admiration, and the comparatively small number of ornaments which he exhibits at Paris will suffice to maintain this reputation. His Greek parure, with a pair of ear-rings, similar to a beautiful antique ornament in filigree now in the Hermitage at St. Petersburg, is an elaborate and exquisite copy of Greek work. In setting our value on this and on other works by the same artist, we feel the importance of keeping clearly in view the distinction between a form of art that is a reproduction of the past, and one that aims at rendering the spirit of another age in, so to say, the language of its own. Palladian was not Greek architecture, though it drew its inspiration from the works of Greek and Roman architecture. Nor can the faithful reproduction of the works of ancient goldsmiths ever take the place of a living art. Such reproductions, indeed, will be beautiful or otherwise just in proportion as the choice of antique models is made by a refined taste like that of M. Castellani, or by the less classically schooled minds of one or two of his followers. But it will be a reproduction of what has passed away, it will not be an art with a vitality of its own, a vitality instinct with progress. On the other hand, imitation and adaptation, but not copying—a veneration for antique methods of treatment that does not sink into an antiquarian devotion to the study and reproduction of mere details—originality, in short, and freedom from whatever is pedantic, is needed in the artist who would really improve the goldsmith's art by handling the subjects of classical myth and

treating the forms of antique art in a spirit consonant with modern thoughts and habits.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

Therefore, Signor Castellani's works, while they are exquisite, and, one may say, perfect, as facsimiles of what was beautiful two thousand years ago, must be looked on but as important steps in the progress of an art that is going back to the fountain of taste and beauty, only, it may be hoped, in order to take a forward stride in the adaptation of the subtle force it may thus acquire. Among his disciples and rivals Mr. Phillips, of Cockspur-street, may be said to have achieved the highest place by admirable work in gold and in enamel, and in the use he has made, in some cases happily, of Oriental and Uruguay agate as a material, and generally by the excellent taste and fine finish of his productions. His efforts at originality of treatment in different historical styles also deserve great praise. Mr. Phillips was the only exhibitor, besides Signor Castellani, not a Frenchman, to whom the gold medal was awarded in this class. Signor Casalta, of Naples, exhibits a scarabæus necklace of admirable execution, in which one has only to regret the somewhat wasteful application of beautiful Etruscan gems. Another English goldsmith, Mr. Brogden, with a laudable desire to emancipate himself from the trammels of fashionable conventionalism in jewellery, has made considerable efforts in seeking good classical as well as other originals for representation. It is, however, only by the actual reproduction of these originals in their proper materials, by their execution with the highest technical skill, and by the most delicate attention to minute details that success is to be attained in this imitative style, certainly not in the attempt to copy, for instance, in gold what the Greek artist executed in terra cotta.

Mr. Phillips
works.

Moreover, it does not follow that because a necklace is antique it must be beautiful. Taste in selection is as important for the copyist as originality is for the higher artist. But where the attempt is made to rise from copying into adapting, and into seeking only an inspiration from the antique, success seems very difficult to attain, and is proportionally rare. For that success depends not merely on a fine taste and appreciation of antique thought and method, but it needs also, if not a scholar's knowledge, yet at least a professional appreciation of the mythological purport of objects figured, and of the different changes in the fashion of treatment that mythological attributes underwent at various periods of the Greek and Roman civilizations.

M. Fontenay has made attempts at the freer treatment of classical subjects, and, within the limits he has assigned to

M. Fonte-
nay's adapt-
ations of
the antique.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.

himself, he has attained considerable, though not uniform success. By the employment of a kind of lustreless enamel the effect of which is very soft, invented and applied by an artist whose name is M. Ruhet, he introduces little paintings into his designs, and these are mounted in gold that is exquisite in finish and in colour, and often, also, in appropriateness of design. Little sets of brooches and earrings, having for their subjects severally a Bacchante, an Omphale, and a Nereid, may be pointed out as especially pretty examples of his style.

Signor
Castellani's
Italian
peasant
jewellery.

Signor Castellani has further contributed in a most valuable manner to the historical data of his art by bringing together a very remarkable collection of the peasant bijouterie of Italy. In this interesting collection, as in the bed of a river replete with pebbles from the rocks of every age that it has traversed, we may see styles of ornament and methods of manufacture that belong to every period and people that have impressed their arts on Italy. Here may be seen earrings and necklaces from Neapolitan villages that are only not Greek because not found in Greek tombs; methods, perhaps Etruscan, of soldering a powder of gold that survive still in the recesses of the Apennines; filigree, with the air of an antiquity that Greek or Roman might have called "indigenous;" and pearl work that looks as though it had come fresh from the Oriental hands that wrought such work in the Middle ages. Then, again, modern styles of bijoux of every date down to those of Louis XIV., Louis XVI., and of our own century. Such are among the illustrations here afforded of the tenacity of life possessed by arts that are entwined with the daily habits and enshrined in the hearts of a people.

Filigree.

Nor are evidences of this vitality in the simpler arts of ornament lacking among other nationalities. On the other hand, they would alone form the subject-matter for an interesting memoir. The filigree-work that is still an industry at Genoa and Malta is as much at home in Norway and the rest of Scandinavia as it is in the hands of the artisans of India; and it survives in all nearly unchanged from what it was in the days when Greek, Etruscan, nay, Phœnician goldsmiths were busy in producing filigree on the shores of the Mediterranean.

Portugal is represented by several artists in gold-filigree from Oporto, Messrs. Sansa and Timano taking the lead among them. Malta—although the delicate works of M. Potella, conspicuous in 1862, are not seen in the Exhibition of 1867—sends the gauze-like ornaments of other houses, among which Ceravolo's little plates of filigree take the

highest place. Mr. Tostrup, of Christiana, however, in a case that is interesting for its reproductions of the silver peasant ornaments of Norway, with their characteristic little suspended discs of mirror-like metal, stands foremost for novelty among the exhibitors of filigree from every quarter of the world. Mr. Christian sends from Copenhagen also excellent reproductions of the ancient Scandinavian forms of ornament, with their sunken Runic patterns of serpentine shapes; and with these are also good works in filigree. India has, however, not contributed much to sustain the character of Hindoo skill in this venerable art.

It is said that even that delicate and most sensitive instrument of touch, the hand of the Hindoo, is not sufficiently sensitive for fashioning the finest sorts of Indian filigree, and that children alone are employed in the manipulation of such a spider-web of wire. Of fabrics so delicate nothing is to be seen among the jewellery at Paris; indeed, the best of the Indian filigree, and that by no means worthy of its source, is to be found among the articles exhibited under the goldsmiths' class. It is to be remarked of this elegant and primitive, perhaps very earliest, form of ornament in precious metal, that it had probably reached its limits for delicacy and design at a very archaic period, and has made no real progress in recent times; that in fact, the early Greek filigrainer worked with as much facility and delicacy as the Hindoo artisan of our day, who inherits the skill and the methods he uses by the direct descent of an immemorial tradition. But there are other forms of the goldsmith's art scarcely less venerable than that of the filigrainer, possessed of great native beauty, and which also have survived in India, through the long roll of centuries, as the Zend or Sanscrit languages have survived there—the inheritance of families or clans. These forms of art are perishing. One by one, as the family in whom it may have been handed down becomes extinct or lets the thread be broken, each of these hereditary industries of India moves on with time to its extinction.

The bowls, the dagger-hilts, and vessels often exquisitely designed and so patiently wrought in the tough substance of the half-precious (and in many lands half-sacred) jade—often also harmoniously jewelled with patterns formed of rubies, emeralds, and diamonds set in a sort of cloison-work of gold—these represent an art which exists no longer.

Indian
jewellery.

The case into which Colonel Guthrie has brought together the unique collection of such jade ornaments he has spared neither time nor cost to make, is thus interesting, not merely as illustrating an art that in its highest forms must rank

Col. Guthrie's collection of jade.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.
—

among the most beautiful in the world, but it also is a monument of that art. For this industry has ceased to exist, perhaps, since the time of Aurungzebe. Certain singular plaques and discs may be seen forming bracelets and brooches in the Indian department, whereon devices in gold are worked, apparently, by sinking the metal into a glass or enamel of a greenish black colour. These curious ornaments are reported to be now worked in India by a single artisan. With him this art, the inheritance of his family, will, it is said, die.

It is little different with some of the methods of enamelling on gold; and there are colours in enamel only produced in India. Even Paris cannot tint an enamel with the ruby red seen on the bracelets of Kessri Bulmuchund, of Lahore. But this case of Indian jewellery, poorly and barely as it represents these native arts, still contains objects well worthy of attention.

Hindoo arts.

There are necklaces consisting of beads of gold or silver, fashioned to imitate the wild olive berry and the native seeds of Hindostan; and they are beautiful and artistic just where the close imitations of vegetable life in gold and silver usually fail; where, for instance, such literal renderings in enamel of fern leaves and foliage as Mr. Brogden exhibits fall short of the higher aims of art. For the native Indian artist has fashioned the metal with that instinctive taste which, while commemorating what is most characteristic in the natural form, yet invests it with a human element: he moulds his gold and silver with a certain sternness of treatment and an abnegation of the multiform and the voluptuous elements of Nature; with qualities, in short, which, for lack of a better name, have been included under the term "conventional." Nor is the instinct for colour in the Hindoo less remarkable than his eye for form; whether we look for it in the pattern of a shawl or a carpet, or in the harmonious association of his rich enamels, or of his precious stones with the gold or the silver of his jewellery; and yet, withal, there is a certain barbaric air about most Indian jewellery which we rarely see in the works of the Hindoo goldsmith or in the tissues of Oriental manufacture. It may be a question how far it is possible to refine the technique of the Hindoo working jeweller without destroying the native beauty and harmony that pervade his work.

It is, however, not improbable that this might be done. But assuredly the way to do it is not to bid the Hindoo copy the viler or even the higher forms of European bijouterie in order to supply the demands of Anglo-Indian society. Of such copies—and they are usually made from the cheaper

bijouterie of the "export" class—there are examples enough in the Exhibition to show the direction in which English "taste" in India would guide the native artisan. And one can only hope to counteract such an influence by improving the tastes or modifying the fashions of the Anglo-Indian public.

For these native arts do not need to be artificially fostered or protected. They need only to be healthily stimulated. They need appreciation, and so much of encouragement as they are worth in the world. A medal from Paris may serve to show the native workman that he can compete when the world competes, and carry off a most honourable prize. It may serve better to prove to Englishmen and still more to Englishwomen, in India that the native style of ornament is worthy of their encouragement. Indeed, the eagerness with which the objects that so miserably represented the jewellery of India were bought up in Paris might alone suggest the question whether there is not much in this Indian jewellery that should give it an honourable place in our jewel-cases. Shawls and carpets have been produced to meet the taste of the West without losing anything of their native character. Selection, or rather the taste that selects well, is what is needed to guide both the purchaser and the producer. Prizes wisely awarded at occasional public exhibitions, and some action on the part of the Government to aid in bringing the better objects exhibited in India within the cognisance of European purchasers, would do much to inform the taste of the English public in India, and to stimulate the higher efforts as well in refinement of finish as in purity of design on the part of the native himself.

Gold chains
and link
work.

Among the forms of the goldsmith's art which may be treated in a distinct group, we may rank chains and other kinds of link-work. Fashioned for the most part of a precious metal, though also frequently of baser material, they are produced in vast quantities, to supply a demand that is constant and extensive; and enormous ingenuity and industry have been expended in producing chains and link-work bracelets of novel patterns and good finish, and at reasonable prices.

A marked progress is visible in this branch of the goldsmith's trade since 1862, mainly, perhaps, due to improvements in machines and in the division of the labour bestowed on the manufacture. From the nature of the case such a trade as that in gold chains is, to a considerable extent, one for exportation. Indeed, though particular firms may produce with especial care chains for the use of the wealthy only, or for the demands of an established home connection,

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.

the fashioning of chains in general partakes of the character of a manufacture.

M. Le Jeune, of Geneva, shows several light and elegant bracelets, with great flexibility imparted to them by the nature of the links; and also chains of excellent construction and finish, and which exhibit much ingenuity in a method of soldering links, each of which is formed of a single piece of metal. Switzerland is further represented by the admirable chains of M. Rouel et Fils.

From Vienna the house of Messrs. Bolzani et Cie sends a large assortment of chains of excellent workmanship.

M. Lion, in the French section, has also good articles at once varied in pattern and cheap in cost; and of them he exports some forms of pattern in considerable quantity to supply the English market. Messrs. Berlize and Férard are a great export house, with whom chains are a specialty; they exhibit several new patterns, at once original and pretty, a merit of some importance in a manufacture on which such great ingenuity has already been expended in England, France, and Germany.

M. Fosse exhibits a novelty in the enamelling of the surfaces of a flat spiral chain not itself new in model; and M. Fribourg claims originality for his mode of forming and uniting the chain links without the employment of solder.

Several English jewellers exhibit chains of a superior quality, among which may be mentioned those of Mr. Watherston, which are excellent in workmanship, if not exhibiting any very recent novelties in design.

Rings also form a specialty with certain houses; and rings of every pattern and fashioned of every material, from massive gold to flimsy copper gilt, and made by every process by which metal is worked, may be seen in the Exhibition.

Few better assortments of old patterns and of the more costly fabric than those of M. Castellani or of Mr. Phillips for simple gold rings will be found. Or one may buy of M. Rigaud gold rings at 36 f. the dozen, whereof 24 f. is the cost of the gold. M. Trux, again, will sell a hundred rings for 40 centimes, gilt by the battery on copper, in the style of the *articles de Lyons*.

Snuff-boxes.

Snuff-boxes, chiefly manufactured in the present day for diplomatic presents, also deserve distinct mention. Those in the Louis XVI. and other styles by Messrs. Lugnet et Cie and of M. Chailloux (in Niello), are excellently finished; and some of the little cases for photographs included with those in Messrs. Lugnet's vitrine are also made with great exactitude. The lockets of M. Lobjois, too, are admirably

made. The snuff-boxes of Herr Michel Goldschmidt, of Hietzing, near Vienna, show great excellence in construction, and especially in that great virtue of a snuff-box—the regular action of their hinges, opening easily and evenly, and shutting closely. Messrs. Rossell et Cie of Geneva, and M. Weishaupt of Hanau, have also excellent examples of this form of bijouterie.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&C.

The decorations belonging to the different orders of chivalry and of merit are objects much circumscribed in their scope as works of art. Still, they require care and exactitude, and present a field for good work in gold and enamel. The commerce in them on the Continent is considerable, no less than four Parisian houses being represented in the Exhibition, with whom these and other decorations in *argent diamanté* form a specialty. M. Lasne claims the first place among these competitors for his excellent work in this industry, but he is followed closely in it by M. Lemaitre.

Decora-
tions.

M. Robineau, of the Rue Turenne, among a series of medals chiefly struck for religious uses, exhibits on one vast rectangular medal of 30 by 22½ centimetres, a large inscription (*Les Commandements de l'Eglise*), the whole being stamped in the same manner as an ordinary medal of smaller dimensions. It is probably a unique specimen of the die-sinker's art.

Medals.

Among other specialties of particular houses may be mentioned that for the little ivory cases to contain sewing implements, known as ladies' *nécessaires*. Among the vitrines of those who exhibit these objects, that of M. Belleau, in particular, contains these useful little cases fashioned with an admirable perfection. Even thimbles form a specialty, and Messrs. Gabler Brothers of Schorndorf (Württemberg), show excellent examples, in some of which agate is introduced to resist the action of the needle; and a similar form of this little implement is exhibited by Messrs. Soergel and Stollmayer, of Gmünd. M. Rion, of Paris, exhibits gold thimbles of excellent manufacture. Messrs. Poullot and Son, of Rue Turenne, exhibit excellent frames for spectacles, extremely light, and mounted on a system of their own. For excellence in this specialty M. Basy, of the Rue St. Martin, is also a competitor.

Thimbles
& Spectacles

The introduction into the jewellers' trade of mountings for jewels ready made for use by the jewellers claims mention in this class, from its great importance in the manufacture of the cheaper forms, and even for its use in the finer kinds of jewellery. These little *chatons* are a somewhat recent invention, and their latest form may be seen in the case of M. Lefebvre in vast variety of size and pattern. The parts of

Mountings.

MR. MAS-
KELYNE,
ON JEWEL-
LERY,
&c.

which each of these *chatons* is built up are separately cut out by machinery, and they are subsequently put together by hand, and fastened by hard soldering. They have already, to a very large extent, become adopted by the Parisian trade, as may be seen in the jewels and bijoux of this section; and their value may be appreciated when it is remembered that, previous to the introduction of the *chaton*, such mountings had always to be cut out of the solid by the patient use of the file. The cost of the mountings of the stones in a piece of jewellery is hereby reduced, in cases where the *chaton* can be employed, from hundreds of francs to a matter of francs only. An older form of the *chaton*, termed the "*galerie*," by its inventor, M. Ferré, of the Rue du Perche, is seen in that exhibitor's case. He stamps or presses out of a sheet of gold or silver a little serrated strip of metal, whereof the serratures stand at equal distances, like the teeth of a short-toothed rake. Various lengths of this galleried material form, on being bent round and soldered, variously-sized mountings (*chatons*), for the retention of the precious stones. The method, adapted chiefly for the less fine forms of jewellery and bijouterie, has been in use for some ten years, and M. Ferré supplies an export trade in his "*galeries*," besides the calls of the Parisian market.

While on the subject of works of especial application in the trade of the jeweller-goldsmith, attention may be called to the diamonds, rubies, sapphires, &c. pierced, for the purpose of drawing fine wire, by M. Poulat, of Ferney (Ain), which have a good reputation, and are excellently drilled.

Among the exhibitors of bijouterie of the finer and more artistic kinds hitherto cited, some have been alluded to, who either entirely or in part should be classed in the category of export houses. The export trade in jewellery is, in fact, one of very large importance in Paris. In addition to names already mentioned, attention may be called to the case of Messrs. Dubois and Demachy, of Rue Michel le Comte. The taste and the workmanship of their "export" bijouterie are almost equal to those of the finest bijouterie for the home market. The crowns for the Queen of Madagascar, and a parure, consisting of a brooch, bracelets, and earrings, and costing only 700f., may be pointed to as excellent examples of their style. Their articles are, for the most part, manufactured for the American market, and if their style lacks the solidity of character demanded by English taste, it accords with a demand where a taste for more delicate ornament prevails. In the production of an establishment of this kind, and we may instance in association with it that of M. Brant and the important house of Messrs. Fritz and

Export
jewellery.

Rogier (representing an export of some 18,000*l.* a year), or that of Messrs. Fuchs and Labbé, the value of the precious metal may be estimated at about half the price paid for an ornament in gold, and, of course, where stones or cameos are introduced the value of these have to be added.

Birmingham, honourably, though hardly adequately, represented by the single house of Mr. Randel, is also an important centre of this industry. Mr. Randel represents a trade equivalent to some 50,000*l.* a year, net sale, and the objects he exhibits show thoroughly good workmanship and a healthy vitality as regards tastefulness of design, evidenced by a marked advance since the Exhibition of 1862.

In several continental cities also, such as Geneva and Stuttgart, considerable export houses are established, and in these cities, as, indeed, in Germany in general, the use of machinery in the manufacture has made important strides. Thus, M. Ehni's establishment at Stuttgart represents an important trade with Havannah and Mexico, while Messrs. Wöhler and Hascher, and Messrs. Renner and Buchler, at Gmünd, are also considerable export houses, and show good workmanship. M. Michael Goldschmidt, of Vienna, also claims a high place among the manufacturers, not only of the finer, but of the "export" kinds of bijouterie.

In Belgium, also, the house of Messrs. Leysen and Kreybich must be mentioned as eminently good in the excellence of its work, and the energy with which it has aimed at a progress which other wealthy and long standing Brussels houses have been content to neglect.

The export trade is not confined to the second class quality of fine bijouterie of which we have been speaking, and which consists of ornaments in silver or in gold (which by law must in France be 18 carats fine), with similar though less select accessories to those which embrace the finest bijouterie. For this trade also embraces plated goods, the *or doublé* of the French, a material formerly manufactured in Birmingham and other English towns to an enormous extent, but very much superseded now by the galvano-plastic and electro-gilding processes which science has substituted for it. This plated copper, or *or doublé* consists of a rolled plate of that metal, on the surface of which a gold layer, amounting to about one-fiftieth of its weight, has been applied by lamination and rolling so as to be brought into absolute contact and in fact metallic union with the copper. Several houses in Paris unite both the forms of business, the export bijouterie and the *or doublé*. M. Rouvenat's admirable establishment for every kind of bijouterie has already been described; and we may point to the case of M. Savard as an example of a

Or doublé.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

house turning out export bijouterie and *or doublé* simultaneously. The right-hand side of his case is filled with the latter, the left-hand side with the former of these kinds of products. Among the plated ornaments, for instance, one sees a bracelet with a pierced design, of which the cost is 60f., its weight being about 13 grammes; or, again, an entire parure, adorned with cameos, may be purchased for the same sum. Another, tastefully designed and well made from fine gold, is sold for 100f. to 120f. It is needless to say that much of this work is made by machinery for stamping, pressing, and otherwise giving form to the parts.

Of export houses dealing in *or doublé* alone, M. Hericé, of the Rue du Parc Royal, and M. Murat, of the Rue du grand Chantier, may be mentioned as showing productions alike excellent and cheap. The machinery by which these are stamped or pressed is admirably exact, inasmuch as the upper and lower parts of a locket or a ring are pressed out from different matrices, and the two parts then soldered together; unless the two matrices fit with an extraordinary precision the line of junction is rendered obtrusive. It is a difficult matter in the works of any of the houses mentioned to find the line at which the soldered parts are united, so admirably are they executed.

Electro-
type and
gilt trinkets.

Another and largely increasing form of industry, falling under the head of trinkets, or export bijouterie, is that in which copper forms the material of the ornament, and the effect of gold or silver is given to it by a process of gilding or silvering, whether by the galvano-plastic method, or by the use of mercury. The splendid works illustrative of English progress in this art, from the houses of the Messrs. Elkington, of Birmingham, or those of Messrs. Shaw and Fisher of Sheffield, and others belong to the class assigned to Orfèvrerie; but Mr. Jacob, of Ely-place, sends some good works of this variety of trinket, and they are as creditable for design as they are good in finish. Several Parisian houses exhibit bijouterie of this kind, and at prices, as may well be supposed, extraordinarily low.

M. Villemont, of the Rue St. Martin, is conspicuous among these for the admirable imitations of fine bijouterie which he exhibits. Bracelets that may even be called beautiful, and showing an admirable colour in the gold laid over them, medallions, and many very pretty parures, are among the gilded and silvered trinkets of M. Villemont's case.

M. Clavier exhibits in his case a species of ornament in this material, with engravings first wrought upon the copper, over which the gold is afterwards deposited by the galvanic pile.

Of course, the designs in gilded copper articles are somewhat limited by the conditions imposed by the character of the machinery by which they are stamped or otherwise fashioned. It is by ingenuity in devising new forms of machinery, and by careful attention to purity of design within the limits alluded to, that progress is to be looked for in an art that really touches the taste of the multitude, and may help to improve and refine it—at least, as much as any other of the arts affecting daily life and intercourse. It is therefore satisfactory to feel that progress has been made, and is continually being made, in the design of cheap trinkets.

MR. MASKELYNE
ON JEWELLERY,
&c.

There remains to be considered a form of bijou ornament that is becoming one of considerable importance, no less than six Parisian houses exhibiting objects under this head. It consists in the application of steel, mostly in the form of small nails or pins of iron, the heads of which are hardened as steel, faceted, and polished. They are then riveted into the iron or silver ornament, fashioned of the required shape. The admirable theatrical ornaments of M. le Blanc Granger, already alluded to, are largely made up of steel, especially in the form of armour, some of which, though of the lightest and least substantial material, yet present great structural ingenuity, a fine polish, and a general finish, as well in design as in execution, hardly to be expected in the dresses for a theatre.

Steel ornaments.

But the parures of M. Huet take rank among articles of genuine bijouterie, and show a taste, a finish, and an artistic character that may remind us of the ancient and extinct industry of Woodstock, in Oxfordshire, where such ornaments were made with an exquisite finish to meet the demands of bygone fashions. M. Bourgain again shows some excellent wares of this description; and in M. Essique's case are seen pearl-like steel ornaments, with fine polish.

In concluding this report, the reporter would wish to state the manner in which the jury in Class 36 came to their decisions; for the value of such decisions, and indeed of international juries at all, would seem to depend entirely on a certain uniformity as well as on a systematic method in the operations of all juries alike, though of course in details the subject matter of each class must suggest differences in the criteria taken as tests of comparison.

The method of the jury.

The jury of Class 36 had books in which every exhibitor's name was entered, and after the name spaces were left in twelve columns, a column being devoted to each of the following modes of estimation:—

1. General perfection of all the works shown.

MR. MAS-
KELYNE
ON JEWEL-
LERY,
&c.

2. Invention in modes of treatment.
3. Taste, generally.
4. Ingenuity or taste in design.
5. Perfection in the manual work of special cases.
6. Machinery employed, if remarkable in any way.
7. Importance and extent of the industry.
8. The amount of the business done by the house.
9. Personal talent shown by the exhibitor.
10. Personal talent shown by artists employed by him.
11. Personal talent shown by artisans employed by him.
12. Pieces especially worthy of being noted.

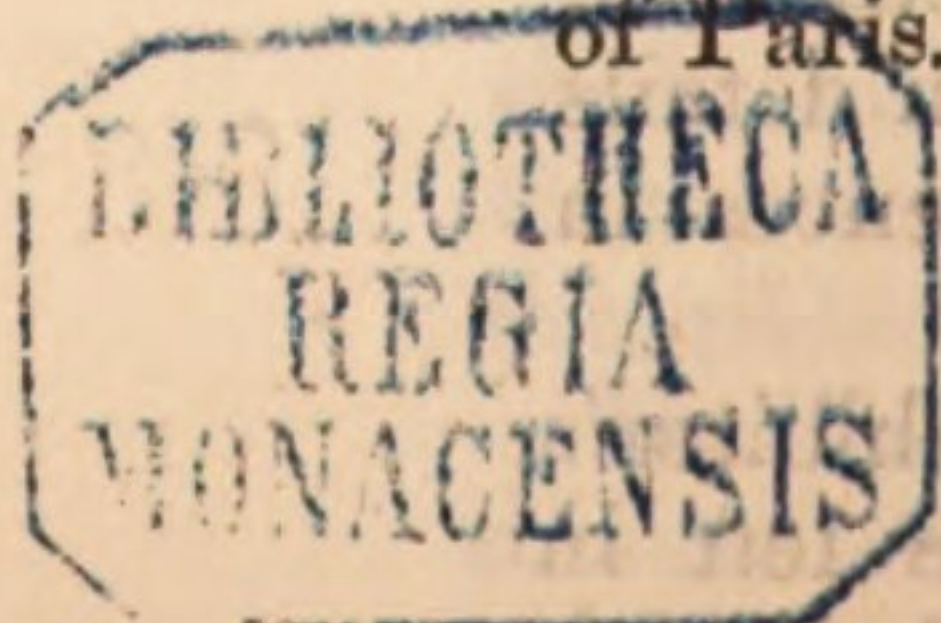
Certain low figures, the values of which were previously agreed on by the members of the jury, were entered in these columns to each name. On inspecting an exhibitor's case, the jury then and there discussed and determined each number under the first, second, third, fourth, fifth, and ninth columns, as these were the most important. By this means the subsequent classification of the whole became little more than a matter of summing these figures.

All the more important cases were again carefully gone over, and in the numerous instances of "ties" in the numbers the decisions subsequently arrived at were the result of much consideration and comparison.

Slight deviations were ultimately made to admit the different varieties of industry to reward; but the results at which the jury arrived were by this method practically unanimous; and the word "nationality" was never introduced into their often protracted discussions on the merits of exhibitors.

This method was instituted at the suggestion of M. Fossin, the able reporter for this class in two previous International Exhibitions, a gentleman to whose large experience, derived from those occasions, the jury were greatly indebted for much information regarding the progress of the different branches of the jeweller's and bijoutier's trade from one Exhibition epoch to another.

The reporter is also greatly indebted to M. Fossin for having introduced him to many of the most important ateliers of Paris.



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REPORTS
ON THE
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1867.

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